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by Peter Kennedy

Ophthalmographia;

OR, A

TREATISE

OF THE

EYE.

Ophthalmographia:

OR A

TREATISE

OF THE

EYE,

In TWO PARTS.

Part I. Containing a New and Exact Description of the EYE; as also the Theory of the Vision considered, with its Objects.

Part II. Containing the Signs, Causes, and Cure of the Maladies incident to the EYE.

To which is added

An APPENDIX of some of the Diseases of the EAR, wherein is observed the Communication between these Two Organs.

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Printed for BERNARD LINTOTT, at the Cross-Key, between the Two Temple-Gates in Fleet-street. MDCCXIII.

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MANCHESTER MEDICAL SOCIETY

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MANCHESTER MEDICAL SOCIETY

TO THE

Very Learned and Ingenious

John Arbuthnott,

Doctor of Physick,

Physician in Ordinary to Her Majesty, as also of Chelsea-*Hospital, Fellow of the College of Physicians, and of the Royal Society.*

SIR,

AFTER having writ this small OPHTHALMOGRAPHIA, I thought to have laid it aside, or kept it for

my own private use, without publishing it to the World; as a Subject not much Studied, and perhaps for this Reason undervalued, because it is mostly pretended to by ignorant People, to the sad Misfortune of such as labour under Diseases of the Eyes.

Nevertheless the more knowing World must allow it to be one of the most curious Branches of Philosophy, Physick and Surgery.

But since You were pleased to read it over in Manuscript, and advised and encouraged

couraged me in the Printing of it, I now put it under Your Protection, since Your greatest Enemies cannot deny You to be a good Judge.

Yet if this little Treatise should not be so acceptable among the Learned, I wish it may at least have the good Effect of making them write a better or more useful one of their own.

I shall not, however, be so vain as to think there are no Errors slipt in; yet I hope You will be so good as to ex-

cuſe them, and that others will take your Example.

If I ſhould ſtuff this *Dedication* with vain Praiſes and Flatteries, ſo common now a-days, it wou'd, I am perſuaded, very much offend your Modeſty; or to ſay any thing of your Character, Knowledge and Learning, were as unneceſſary, eſpecially ſince they are ſo well known and diſtinguiſhed by the Queen and Beſt of the Nation.

But I hope You will accept of this as a Demonſtration of the Eſteem and Reſpect

DEDICATION.

I owe You, and as a ſmall Token of Gratitude, or Acknowledgment for the Favour and Civility You have been pleaſed to ſhew to,

SIR,

Your moſt Humble and

Moſt Obedient Servant,

PETER KENNEDY.

MANCHESTER MEDICAL SOCIETY

THE PREFACE.

THE Reasons for my undertaking to write something on this Subject, was partly from the Experience I had from other Patients as well as my self, who to my Sorrow was troubled with sore Eyes for many Years, during my Childhood and upwards, which was a great hindrance to my Studies. And although now, thank God, they are well, yet still but weakly; the best Remedy for that, being a careful Usage.

This is a Misfortune that has attended some of the best of Writers upon particular Subjects, (although that is a Character I cannot pretend to)

to) such as *Morton* and *Floyer*, upon *Consumption* and *Asthma*; the first of those died of the same Distemper, and the second still remains *Asthmatick*. Nor I think ought a Man be thought less capable in other Parts, or Branches, because he writes Particularly upon one.

The next thing I consider'd was, that we had not as yet any thing tollerable on the Subject in the *English* Tongue, and for that Reason hope it may be of some Use.

The Reader will find a great many new Things in the Description of the Eye, as likewise in the Theory of Vision, consider'd with some of its Diseases, also in the Method of Cures, with many Observations in my own Practice, not at all taken notice of by *Galen*, *Plempius*, *Briggs*, *Maitre-jean*, *Briseau*, or any other *Latin*, *French*, or *Italian* Author.

The

The *Appendix* of the Communications of ſome Diſeaſes betwixt the Eye and Ear, I think is entirely New.

The Method then I have taken in this little Treatiſe is, Firſt to deſcribe the external Parts of the Eye, and next its *Tunics* with their Veſſels; alſo ſome Diviſions and Obſervations on the Coats, *Ligamentum Ciliare,* and *Membranes,* made by different Modern Anatomiſts as well as my ſelf, ſuch as the famous Mr. *Ruyſh,* and *Row,* at *Amſterdam,* or *Maitre-jean* at *Paris.*

After which, I treat of the different Humours, the Aqueous, Chriſtaline and Vitrious; where I ſhew that the Aqueous ſeems to come from the Vitrious, and that the latter, which has hitherto been taken for a Congealed ſort of Humour, is nothing elſe but a Combination or Number of little Veſicles full of Water, or the Aqueous Humour.

And

And next of the Theory of Vision, which I apply and consider with some Diseases, such as *Myopia*, *Presbitia*, *Gutta Serena*, and Cataracts.

In the second Part, I treat of the Signs, Causes, and Cure of the Maladies incident to the Eye.

Lastly, the Diseases of the Ear, in which I observe the immediate Communications of some Diseases betwixt those Two Organs of Sight and Hearing.

The Copper Plate of the Anatomy of the Eye, is rather to Demonstrate the common Parts than the most Minute, such as the Division of the *Choroïdes*, or *Vesicles* of the Vitrious; circular *Tubes* or *Fibres* of the Christaline or *Sinus* in the *Ligamentum Ciliare*, &c.

The Plate of Vision shews it self how Objects are represented to the Eye, or imprinted upon the *Retina*.

If

If the Stile or Language ſhould not pleaſe, I hope it will be the more excuſable, if conſidered, that I have been Abroad moſt part of my Time in Foreign Countries.

ERRATA.

PAGE 12. Line 4. for *cicatrix* read *cicatriſe*. P. 44. l. 14. for *Sacchrum* r. *Saccharum*. P. 49. l. 13. for *Euphraq.* r. *Euphrag.* P. 66. l. 16. for *or an Apple* r. *an Apple*. l. 18. for *Mouſe* r. *Flye*.

THE

THE CONTENTS.

PART I.

CHAP. I.

Containing a Description of the Muscles of the Eye, and some of its external Parts. Page 1

CHAP. II.

Containing a Description of the Optick Nerves, and proper Tunics of the Globe. 9

CHAP.

CHAP. III.

Of the Tunica Choroïdes, Ligamentum Ciliare, Uvea *and* Iris. p. 12

CHAP. IV.

Of the Retina. 15

CHAP. V.

Of the Vitrious Humour. 16

CHAP. VI.

Of the Chrystalline Humour. 18

CHAP. VII.

Of the Aqueous Humour. 20

CHAP. VIII.

THEORY of VISION, considered with some of the Diseases of the Eye. 22

PART

PART II.

CHAP. I.

Of the growing together of the Eye-lids. p. 32

CHAP. II.

Lagophthalmos, *or drawing up of the ſuperior Eye-lid.* 33

CHAP. III.

Ectropion, *the lower Eye-lid falling down, or Inſide out.* ibid.

CHAP. IV.

The Antoniatonblepharon. 34

CHAP. V.

Of the Stayen, *or little Tumour call'd by the* Greeks Piſthia *or* Crithe; *the* Latins, Hordelium *or* Grando. ibid.

CHAP. VI.

Trichiasis, *or* Phalangosis. p. 35

CHAP. VII.

Psorophthalmia, *or* Lippitudo. 36

CHAP. VIII.

Verruca, Ficus *or* Sycosis. 37

CHAP. IX.

Sclirosis, *or* Durities Palpebrarum. 38

CHAP. X.

Ægilops, *or* Fistula lachrimalis. 39

CHAP. XI.

Ecanthis, *or Excrescence in the great Corner.* 40

CHAP. XII.

Pterygium, Unguis, *or* Ungula. 41

CHAP. XIII.

Of Albugo, *or the white Spot in the Eye.* 43

CHAP. XIV.

Of Phlyctæna, *or Ulcers of the Conjunctive and* Cornea. p. 44

CHAP. XV.

Of the Carnous Excrescences. 45

CHAP. XVI.

Of Ophthalmia, Fluxus oculi *or* Delachrimatio. ibid.

CHAP. XVII.

Rhexis, *or the burſten Eye.* 50

CHAP. XVIII.

Syrchiſis, *or a Confuſion of the Sight, Blood and Humours of the Eyes.* 52

CHAP. XIX.

Of the Eye ſtarting entirely out of the Orbit by Stroak or Wound. 53

CHAP. XX.

Of the more common or more slight Wounds of the Eye, or Dust, Dirt, &c. p. 54

CHAP. XXI.

Of Hypospagma, *or Ruption of the Blood Vessels.* 57

CHAP. XXII.

Exophthalmia, *or the preternatural big Eye.* 58

CHAP. XXIII.

Atrophia, *or Decay of the Eye.* 61

CHAP. XXIV.

Hypopyon, *or an Abcess of the* Tunica Cornea. 62

CHAP. XXV.

Of the Abcess or Imposthumation of the Uvea *and* Choroides. 65

CHAP.

CHAP. XXVI.

Staphyloma, *or falling out of the* Uvea. p. 66

CHAP. XXVII.

Mydriasis, *or preternatural Dilatation of the* Pupille. 68

CHAP. XXVIII.

Of the preternatural Contraction of the Pupille. 69

CHAP. XXIX.

Nyctalopia, *or Night Blindness.* ibid.

CHAP. XXX.

Hemeralopia, *or Day Blindness.* 70

CHAP. XXXI.

Of Amaurosis, *or* Gutta Serena. 71

CHAP. XXXII.

Of the Preternatural Extention of the Vitrious Humour. 73

CHAP.

CHAP. XXXIII.

Of Hypochyma, Suffusio, *or* Cataract. p. 75

CHAP. XXXIV.

The Manner of Operation for the Cataract. 87

CHAP. XXXV.

Some particular Observations I made in Couching. 91

CHAP. XXXVI.

Of the Glaucoma, *or Disease of the Christaline Humour.* 94

APPENDIX.

CHAP. I.

OF the Diseases of the Ear, and of the mutual Communications of some Diseases in the Eye and Ear. p. 99

CHAP. II.

Inflammation of the Membrane of the Meatus Auditorius. 103

CHAP. III.

Of Dolor in the Ear by Cold. 104

CHAP. IV.

Of Impostumation or Tumours of the Ear. 105

CHAP. V.

Of the Ulcers in the Ears. 106

CHAP.

CHAP. VI.

Of Worms in the Ears. p. 107

CHAP. VII.

Of Dulneſs of Hearing occaſion'd by Stoppage or Swelling of the Aqueduct, or Ductus Falopianus. ibid.

CHAP. VIII.

Of the Wax hardened in the Meatus Auditorius. 108

CHAP. IX.

Of the extraordinary Extenſion and Relaxation of the Membrana Tympani. 109

Fig. 1.

a: the Eye brow.
b: the Eye lidd.
c: the Cilia or Eye latches.
d: the great Canthus
e: the External Angle.
f: the lower Eye lidd.
g: the lower Eye latches.

Fig. 2.

a: the Christaline
b: ye Ligamentum Ciliare.
C: the Vitrious.

Fig. 3.

A: Musculus Attollens.
B: Deprimens.
C: Adducens.
D: Abducens.
E: Obliquus inferior.
f: Obliquus superior.
g: the Circular Cartilage or Trochlea.
aaaa: Branches of the Nerve Oculorum Motores.
H: the Optick Nerve.
I: the Iris within the Cornea.
K: the Pupill.

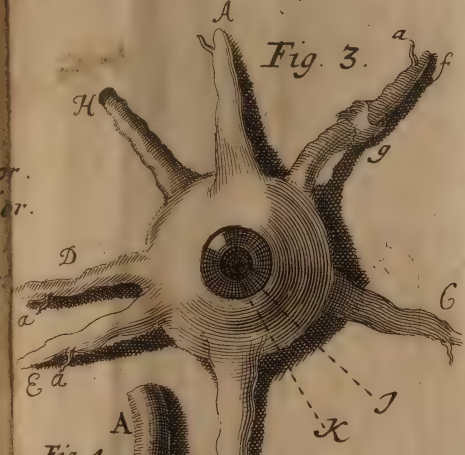


Fig. 4.

A: the Optick Nerve.
b: the Tunica Sclerotica.
c: Choroides or Uvea.
D: Retina.
e: part of the Cornea.

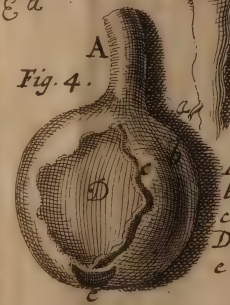
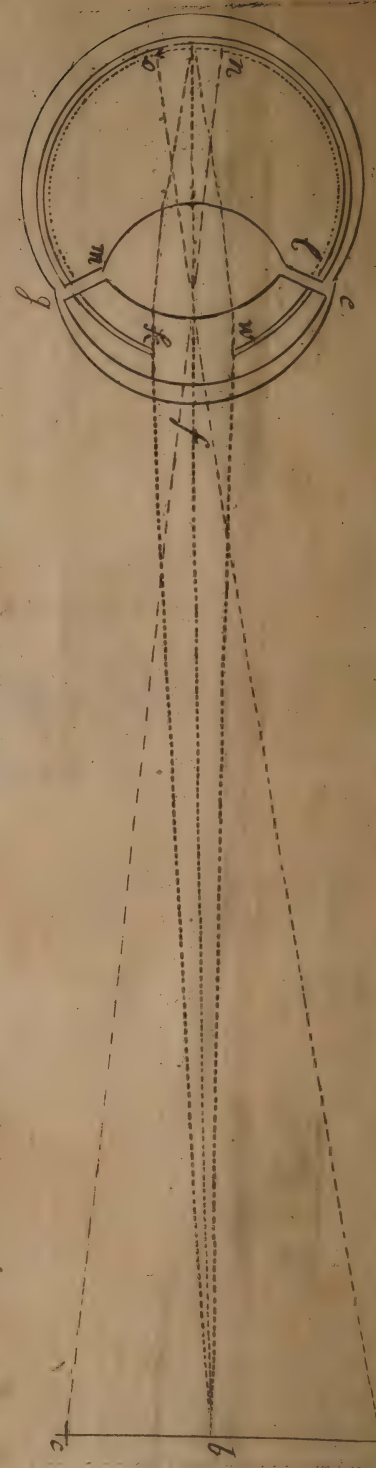


Fig. 5.

A A: the Cutis.
b b: Glandula Lachrymalis superior.
c: the Caruncula or by some called Glandula inferior.
d d: the Orifices or Ducts of ye Lachrymal Gland.
E: small Glands. f: the Cartilage call'd Cilia.
g g g: the Hairs or Eye latches.
h h: part of the bone of the Nose.
i: ye Duct conveying ye Lachrymæ to ye Nose.

Figure how Objects are represented to the Eye, or the External images imprinted upon the Retina.

a b c: the External Object.
b: a point in the Object which sends a Cone or pencill of luminous Rays to ye Eye.
e f g: the Cornea which makes the first Refraction or makes the Rays Converge.
m k: the Uvea in the Aqueous humour.
e l m g: the ligamentum Ciliare.
l m: the Christaline which makes ye principal Refraction of the Rays, or makes them Converge in a point upon the Retina.
n o: the internall Object form'd upon ye Retina.



Ophthalmographia:

OR, A

TREATISE

OF THE

EYE.

PART I.

CHAP. I.

Containing a Deſcription of the Muſcles, and ſome of its external Parts.

SINCE the Eye has been ſo often deſcribed by different Anatomiſts, I ſhall be the more brief on the Parts ſo commonly known, and ſhall more particularly take Notice of what is not in other Authors.

The Palpebræ *and their Muscles.*

The first Parts, then, of this Organ, are the Eye-brows, or a parcel of Hairs, planted there in order. The next are the *Palpebræ*, or Eye-lids: Then the Corrugator Muscles, whose Origins are in the great *Canthus* of the Eye, and terminate in the middle of the Eye-brow; as likewise the Orbicular Muscles which come from the same *Canthus*, and their Fibres running along the Eye-lids, insert themselves together into the lesser, although some call it but one Muscle that goes round from the great *Canthus*, and comes back to be inserted in the same place. These, I believe, may contribute, with the Contraction of the Pupil, to hinder so many Rays going in when Light is too strong; that is, the Hairs, with the Contraction of these Muscles, hinder and obstruct a great many of the Rays falling upon the *Cornea*.

Besides these, there is the *Musculus rectus*, which rises from the bottom of the Orbit, where the Optick Nerve enters, and its Tendon is inserted into the Border of the Eye-lid, which serves to draw it upwards; in a word, the *Cutis*, *Cuticula*, Fibres of the Orbicular Muscle and *Tunica conjunctiva* form the said Eye-lids, the latter *Tunica* is continued from the Globe to line its Inside.

Round

Round their Edges are so many small Cartilages, called the *Cilia*, under which there opens the Mouths of the excretory Ducts of some small Glands which are ranged there, and separate a sort of Wax that gum or fasten the Eyes when asleep. These Hairs defend the Eyes from Dust, Flies and too much Light. *The* Cilia.

Some will have the *Tunica conjunctiva* only to be a Production of the Skin, but others, to which Opinion I mostly incline, take it to be a Production of the *Pericranium*. It adheres to the Edges of the Orbit, lines the Eye-lids, and covers the fore part of the Globe, that is not only the White of the Eye, but seems to me likewise to cover the *Cornea*, although there of a delicate fine transparent Texture, not so easily to be observed as in common *Opthalmia's*, where its small Blood Vessels become more turgid and apparent. This Membrane, as most others, may be divided into two or three; so that one part is by some named *conjunctiva*, the other *innominata*. In treating of *Opthalmia*, I have taken notice of the great Sympathy or Communication that is betwixt the Eye and Ear, in violent Inflammations of this Membrane. *The* Tunica conjunctiva.

The *Glandula lachrimalis* is situated upon the upper part of the Globe of the Eye, and commonly is divided into several Lobes, *The* Glandula lachrimalis.

though sometimes in one, varying much in its Figure. It is a Gland very large, and lying upon the Globe, on the Backside of the *Tunica conjunctiva* extends it self almost from the upper part of the lesser *Canthus* to the greater; it sends out several small excretory Ducts, which pierce the foresaid *Tunica*, near the *Cilia*, and out of which the Tears are sent to moisten the external part of the Globe of the Eye. This Gland by some is called the *Glandula lachrimalis superior*, and is properly the lachrymal Gland, that sends those Tears to the Eye; which being fully moistened, the superfluous run down to the two *Puncta* in the great *Canthus*, called *Puncta lachrimalia*, betwixt which lies the *Caruncula lachrimalis*, formerly called *the Gland*, and by some the *Glandula inferior*. It seems to be a Continuation or gathering together of the inner Membrane of the Eye-lids.

The Sacculus lachrimalis.

Under this lies the *Sacculus lachrimalis* placed upon the *Os unguis* or *lachrimalis*; it receives the Tears from the two *puncta* in its upper part, and sends them thro' the Duct which is continued from its bottom thro the hole of the *Os lacrimale*, and comes ou under the External *Lamina* of the *Os spon gioſum*, to moisten the inner Membrane o the Nose. This *Sacculus*, or little Bag seems to be a Continuation or Extensio of the inner Membrane of the Nose: S

thi

that it is glandulous as well as that Membrane. In this great *Canthus* of the Eye is form'd the Tumour call'd *Ægylops*, and its Matter degenerating, makes that we call the *Fistula lachrimalis*. The tumifaction of the Lachrimal Bag hinders the Tears from going the right way into the Nose; so that they come to run down the Cheeks, in which case there is necessity of Manual Operation, by making a large Incision upon the Tumour; nor is there such great danger of cutting the Orbicular Muscle, as is commonly suppos'd, although most safe to cut according to the direction of its Fibres, after which some make use of actual Cauterie to bring away the *Os unguis*; others pierce and break entirely through it, so that the Tears may have Passage that way, for it cannot exfoliate as other Bones do, by reason of its having only one *Lamina*, so that the whole Bone comes out if burn'd, and if broke comes in pieces by the Nose, since the Wound in the *Canthus*, in that case, is healed up as soon as possible.

Of the Muscles of the Eye.

The Globe of the Eye is moved by six different Muscles, four of which move it streightways, and two obliquely. The *Superbus* or *Attollens*, is the first of the four streight Muscles, lies on the upper part of the Globe, and draws it upwards. The second is its Antagonist, call'd the *Humilis*:

This being inserted below, draws it downwards. The *Adductor* is the third, draws it to the Nose; and the fourth, the *Abductor*, draws it from the Nose. These four Muscles are round and fleshy belly'd; they all take their Origines round the Hole through which the Optick Nerve enters in the bottom of the Orbit, and running along the Globe directly opposite one to another, terminate in four large broad Tendons, or rather join altogether, making a sort of an *Aponeurosis*, which runs betwixt the *Sclerotica* and *Conjunctiva*, to which it adheres, inserting itself round the *Cornea*. These Muscles acting equally all together, draw the Globe in towards the bottom of the Orbit.

The fifth, or *Obliquus major*, rises from the bottom of the Orbit near the *Adductor*, and goes directly towards the great *Canthus*, where growing to a round Tendon, passes through a little Cartilaginous Ring, which serves as a Pulley, and from that going backwards, is inserted in the upper part of the Globe near the *Superbus*, a little towards the lesser *Canthus*.

The *Obliquus minor* is the sixth, it arises from the inferior and almost external part of the Orbit towards the great Angle, and ascending obliquely towards the outward Angle of the Eye, is inserted in the external and upper part of the Globe, uni-

uniting its Tendon with the *Obliquus major* to the Circumference of the *Cornea*. The first serves to draw it forwards, and turn its Pupil downwards. The second draws it forwards and upwards, and acting together, draw the Globe fixedly to the Nose. All these Muscles acting differently, keep the Eye in a continual Motion.

Of the Nerves and Blood-Vessels.

The external parts of the Eye are furnish'd with three pair of Nerves, the first of which are the *Oculorum Motores*; their Origin is in the *Medulla oblongata*, by the *infundibulum* passing by the *Carotides*, enter the Orbit at the *Foramina lacera*, the greatest part of which is spent upon the *Attollens*, *Deprimens* and *Obliquus minor*, and its smaller branch joins with the *Ramus Opthalmicus* of the fifth pair, and makes up that called the *Plexus opthalmicus*, which is spent partly upon the Tunicles, and some part on the Muscles of the Eye-lids. Next those are the *Par patheticum*, or fourth pair, which arise behind the *Testes*, and passing along the sides of the *Sella turcica*, likewise enter the Orbit by the *Foramina lacera*, and is wholly distributed in the Muscle *Obliquus major* of the Eye. This is call'd *Pathetick*, because it is said to be the occasion of the said Muscle's shewing involuntary Motions in the different Passions or Perturbations of the Mind, such as Love and Hatred.

The third is the *Ramus opthalmicus*, which is a Branch of the fifth pair of Nerves, arising from the side and forepart of the *Proceſſus annularis* of the Brain.

I ſhall not ſo particularly take notice of the other Branches of the fifth pair, only in general, that they are ſpread in the Jaws, Teeth, Muſcles of the Cheek, *Crotaphites*, Muſcles of the *Pharinx*, Tongue, Muſcles of the Tongue, *Glandula ſublingualis*, and Chin. Theſe likewiſe have a ſmall Branch which comes to form the *Chorda Tympani*; as likewiſe a Branch which joins the *Portio dura* on the Jaw. Theſe Diſtributions I take a little notice of, becauſe of the Sympathy thoſe Parts ſometimes may have with the Diſeaſes of the Eyes; the principal Branch, however, we are to take notice of, is, as I have ſaid, the *Ramus opthalmicus*, which enters the Orbit by the ſame hole as the others, forming the *Plexus opthalmicus* with the *Motorii*, part of which is ſpent on the *Glandula lacrimalis* and *Sclerotica*, the reſt goes by different Branches to the frontal Muſcles and internal Noſe.

The principal Branch of the ſixth pair likewiſe enters the *Foramina lacera*, and is ſpent on the *Abductor* Muſcle, the other Branch makes that called the Intercoſtal Nerve. The Arterial Blood is brought by Branches from the *Carotides*, one Branch

is

is sent by the external *Carotide* to the Muscles of the Eye-lid, and the internal *Carotide* being enter'd the Skull, sends a Branch which runs along with the Optick Nerve for the Distribution of the whole Eye, and the Veins return the Blood to the internal and external Jugulars.

CHAP. II.

Containing a Description of the Optick Nerves, and proper Tunics of the Globe.

THE Optick Nerves are called the second pair of the Brain, and are bigger than any else. They take their Origin from the superior parts of those two round Bodies called the *Thalami Nervorum Opticorum*, and from the Extremities of the *Corpora striata*.

I would not too forwardly pretend to tell the Uses of those different parts of the Brain; but I think it seems probable all those Bodies, such as the *Thalami*, &c. from whence the Nerves take their Origin, may be so many different Glands for secerning what's proper for them, or the parts the said Glands convey to.

Thus leaving the Brain, they unite above the *Sella Turcica*, and immediately again separating, they pass betwixt the two Carodital

rodital Arteries, and enter in at the Orbit by their own proper Holes, being the foremoſt of the *Os ſphænoïdes*, after which entering the Globe they ſpread their Medullary Fibres upon the Vitrious Humour, and is that which is call'd the *Retina.*

This Nerve in Men enters near the middle of the backſide of the Globe; but in *Quadrupedes*, it enters more obliquely, or on one ſide; before it comes out of the Skull, it takes its external Coat from the *Dura mater*, the which, when in the Orbit, makes up that Tunic of the Eye called *Sclerotica*, and its forepart *Cornea*, as ſome or moſt Anatomiſts think.

The *Sclerotica* is a hard, thick and Opack Membrane, and ſcarce to be divided as other Membranes, becauſe of the many Fibres which run croſs or tranſverſly in it.

The *Cornea* is commonly call'd another Coat, although it is nothing elſe but a continuation of the former, only that it's clear and tranſparent. It lies in the forepart of the Globe, and it is through this that the Rays of Light do paſs. This ſeems to divide more eaſily into different *Laminæ*, it takes the Name, becauſe it is like to Horn, and round it is that commonly call'd the White of the Eye. It is much about the bigneſs of a Silver *Engliſh* Two-

Twopence, or four Lines in Diameter, and although it is so very transparent, yet it has many Blood Vessels for its Nourishment, and when those come to be obstructed is render'd Opack, so that the Rays of Light cannot pass as they did before; those Vessels come from that Ramification of the *Carotides* which accompanies the Optick Nerve, and distributes it self first into the *Sclerotica*, and through the *Cornea* it also casts off a Branch which passes into the *Choroides*, *Ligamentum ciliare* and *Retina*. The Nerves are from the Opthalmick Branch of the fifth pair, and are distributed there, and in the internal Tunics. The Blood is brought back from thence by the Veins to the Jugulars.

The *Cornea* is much more Convex than the rest of the Globe of the Eye; and in some Birds, and other Creatures, much more Convex than in Men, and in some others less, and this Difference contributes to make the Object appear bigger or lesser, the *Sclerotica* and *Cornea* form the Globe of the Eye, although it be not perfectly Spherical; the *Cornea* is a Section of a much lesser Sphere than the *Sclerotica*, and consequently more Convex, and this Section is truly Spherical.

The *Cornea* is much more sensible to the Touch than the White of the Eye, and Wounds

Wounds here are very dangerous to the Sight; for the Humours, or fluids Stopping, commonly render it Opack altogether, but at beſt the Cicatrix of a Wound, or Small Pock, will always remain; ſo that thoſe Rays muſt be loſt. Although they may ſee a little by the reſt of the *Cornea* if it keeps tranſparent, which is but ſeldom.

CHAP. III.

Of the Tunica Choroïdes, Ligamentum Ciliare, Uvea *and* Iris.

THIS Coat, or Membrane, *Choroïdes*, is immediately next to the *Sclerotica*, it is commonly thought to be a Production of the *Pia mater*, becauſe it is next, and round the Optick Nerve.

The *Slerotica* is on its outſide, and the *Retina* lies on its inſide, whoſe Medullary Fibres it embraces with the Vitrious Humour, as far as the *Ligamentum ciliare*, after which it takes the Name of *Uvea* and *Iris*. This Membrane is ting'd black, by reaſon of ſome Glands that ſeparate a black Juice to give it that Colour, being waſh'd in Water it becomes white. Its dark Colour ſeems neceſſary behind the *Retina* which is white, to make leſs Confuſion when Objects are painted there. Mr. *Ruyſh* divides

divides it in two, and calls the outer one *Choroïdes*, and the inner *Tunica Ruyshiana*. However (as I said before) most soft Membranes may be divided in several; its Blood Vessels is from the Branch that comes in with the Optick Nerve to the *Sclerotica*, from which they are numerously spread upon this Membrane.

The *Uvea* is a continuation or joining with this and the *Ligamentum ciliare*, it is compos'd of streight and circular Fibres, for the Contraction and Dilatation of the round Hole in its middle call'd *Pupil*; when the Rays of Light which enter there are either too many or too few; its streight Fibres which dilate it, come from the joining with the *Ligamentum ciliare*, and go as far as the *Pupil*, where they make a sort of Border; the others which contract it are circular, but come not quite to the edge of the *Pupil*; so that the *Uvea* is very thin and tender there, and care should be had in Couching not to touch it, since very easily wounded, and in that case the *Pupil* loses its form. This once happen'd to my self, although the Patient continued to see after the Operation, and that the Cataract was beat down, yet 'tis very probable had not this Accident happen'd, she might have seen better. This was the first I couched, and the second time I had passed in the Needle, because the Cataract wou'd not

not remain down ; and having punctured another part the Humour Aqueous came out by the firſt Orifice, ſo that the *Uvea* and parts within had not that full Tenſity juſt then as before. In a Day or two's time it recovers the Aqueous Humour as at firſt. This Patient nevertheleſs ſaw better than Expectation.

The outſide of the *Uvea* is called *Iris*, becauſe it is of different Colours, and the Eyes are called Blue, Yellow, Grey or Black, according as the *Iris* is, or the moſt of ſome one or other of theſe Colours. Some think that according to the predominant Humour of the Body and Brain the *Iris* has its Colour, and certainly ſomething may be judged, I think, of the briskneſs, ſlowneſs, or languidneſs of the Temperament, according to the different Colours of the Eyes.

The *Ligamentum ciliare* ariſes from a little circular Proceſs or Coronet, which makes a Partition to the *Choroides* and *Uvea*; it likewiſe adheres with its Circle where the *Opaque Sclerotica* and tranſparent *Cornea* meet; from hence it forms a delicate Membrane, which runs upon the outſide of the Glaſſie Humour, or from the Circumference to the Center, that is from this Coronet to the Cryſtalline.

This Membrane is full of Arteries, Veins and Nerves. Mr. *Row*, Profeſſor

of Anatomy at *Amsterdam*, shews a *Sinus* here in the Eye of a Cod-fish, which runs circularly round its edges, and in which there is a thin Serous Blood contained: The Opinions of the use of this Ligament are different; some think it contracts, and by that means makes the Chrystalline to advance, and the *Retina* to retire back, in order to lengthen the *Axis* of Vision when Objects are too near; others only consider it as a Ligament to keep the Chrystalline fast in its place, which no doubt is part of its use; but it certainly has another, for the many Blood Vessels which are in it, and the *Sinus* observed by Mr. *Row*. Nor, I think, can the Vitrious and Chrystalline Humours, with their Coats, be nourish'd from any other Vessels but these, since continu'd, or adhering to no other Membrane but this. It is likewise observable, that it has many black Ducts or Channels, which run from the Circumference to the Chrystalline, full of that black Liquor of the *Uvea*, and may be squeezed out.

CHAP. IV.

Of the RETINA.

AS I have said before, the Medullary Fibres of the Optic Nerve enter the Globe, and there form this Net, or *Retina*;

tina; it is of a very delicate Texture, especially in young Creatures; it immediately embraces the Vitrious Humour, and seems to adhere to the little Circular Process, or where the *Ligamentum ciliare* rises. Its Blood Vessels come from that Branch which accompanies the Optic Nerve, and peirces the Coats *Sclerotica* and *Choroïdes*; the said Blood Vessels spread themselves very numerously upon it. The Ingenious Doctor *Pitcairn* takes it to be the Obstruction of the Blood Vessels, which hinders the Impression of Objects upon the *Retina*; and makes what they call *Gutta Serena*, for it is here that the Images of all Objects are painted, that is where the Rays of the External Object meet in their true Point or *Focus* (by means of the *Cornea* and Chrystalline Humour) and imprint this External Image inverted there, of which I shall say more hereafter, in treating of Vision in particular.

CHAP. V.

Of the Vitrious Humour.

THIS Humour takes up the greatest part of the Eye, that is from the bottom of the Globe to the *Ligamentum ciliare*; it is Spherical behind, and in its middle before is Concave, in which the Chri-

stal-

Chrystalline Humour lies; it is a very transparent Substance, not so hard as the Chrystalline, or so fluid as the Aqueous. It is commonly taken for a congeal'd sort of Humour, although it seems more probably to be nothing else but a number of delicate little Vesicles or Cellules full of Water, for in touching it is always moist and watterish; when cut, the moisture comes out more abundantly from it, or by rubbing it betwixt the Palms of your Hands the Water comes out, and will rub almost to nothing but Membrane. By observing with a Microscope when cut, you will see many little airy Bubbles to arise from it; being dried it evaporates, and that delicate Membranous Body is almost wither'd to nothing. Its use seems chiefly to keep the Chrystalline Humour at the proper distance from the *Retina*, as I shall shew in speaking of Vision. It has a delicate Membrane or Tunic, with which it is cover'd, and takes its Name from the Humour. This Membrane is adherent to the * *Ligamentum ciliare*, and no doubt has its Blood Vessels from thence; as also the little Vesicles as well as all the other Membranes of the Body, which must be nourished by Blood Vessels, altho' so delicate that they are not to be seen; yet this needs not seem strange, when we consider that those of the *Cornea* which are larger by much, are not how-

* *And the* Ligamentum ciliare *from the* Choroïdes.

ever at all to be ſeen, 'till they become turgid, and ſwell in *Opthalmia's*. Or even indeed thoſe of the *Tunica adnata* or *conjunctiva*, 'till inflamed as I have ſaid. Whether this Humour communicates with the Chryſtalline, is what I cannot determine; but it's certain, that its Membrane or Coat is not only continued or adherent to the *Ligamentum ciliare*, but likewiſe to the *Tunica aranea*, or Membrane which immediately covers the Chryſtalline Humour.

CHAP. VI.

Of the Chryſtalline Humour.

IT's called ſo from the likeneſs it has to Chryſtal, it lies in the Cavity of the middle and forepart of the Vitrious Humour. It is of a much more hard and ſolid Subſtance than the former, and is Convex on both ſides; its backſide towards the Vitrious, is much more Convex than the other; it lies immediately before the *Pupil* behind the *Uvea*, ſo that its foreſide lies in the Aqueous Humour. The *Tunica* with which it is covered is called the *Aranea*, becauſe of ſuch a very delicate Texture : This Membrane adheres to, or is continued from the Vitrious Tunic and *Ligamentum ciliare*.

Its Subſtance is commonly taken for a congeal'd ſort of Body, as the Vitrious has like-

likewise been taken to be, but that no doubt proceeded from not examining it rightly, or rather not at all; for few are so ignorant, as not to have seen a Fish Eye boyl'd, or any other Creatures, the Chrystalline of which becomes white, and comes all off in so many different Coats or *Laminæ*.

It's however very hard positively to determine what it is, but I believe none will deny but that it must be nourished, yet whether it be made up of pelucid fine Tubes, or delicate transparent Membranes closely compacted together, or whether so many little Scales lying one on the top of another as the *Cuticula* is supposed to be, are Questions; but I think the latter seems the most probable, because of its throwing off in Coats or Skins in the manner aforesaid, nor does that Coat or Skin keep very close together, but may easily be bruised or crumbled, probably into so many different Scales. When put into hot Water a little while and not boil'd, it makes a glutinous sort of Substance, something not unlike Isinglass; and when I break and examine its middle, I find it compos'd of Circular sort of Fibres of an Icy colour, making lesser Circles as they come nearer the Center; it grows little or nothing less than before by boiling. It lies in a perfect sort of *Sacculus*, that is, its *Tunica aranea*, being continued from the Vitrious Tunick, and *Ligamentum ci-*

In the middle about its Center, it is much harder than its outside, and boiling it grows extremely hard.

liare come closely round it, so that it lies very fixed and fast, but if you cut its Tunic on top or side, it immediately springs out; so that it seems not to be any way adherent to its Membranes, which however no doubt must send it in moisture, but whether by imbibing it, as some think, is what I cannot be positive in, but it seems to be independent, or not to adhere to any thing. Its Coat I think being something to it not unlike the *Pericardium*, only that the *Aranea* lies closely round it, yet there is certainly a little Moisture betwixt them.

CHAP. VII.

Of the Aqueous Humour.

IT lies immediately under the *Cornea* on both sides the *Uvea* or *Iris*, it fills the *Pupil*, and lies round the out or foreside of the Chrystalline and *Ligamentum ciliare*; it is not common Water, but has something Spirituous and Viscous in its Nature. There are some Anatomists of late that have pretended to shew the *Ducts* from whence it comes, but have never satisfied others about them, for my part I cou'd never see any such thing. Yet I have not any great difficulty of thinking from whence it comes, since that Water contained

ed in the Vitrious being compared with it is the very same; and the quantity taken out of the Vitrious by breaking or rubbing it, as I have said, will surpass the other: Nor is it, I think, very hard to conceive, that this Spirituous and slippery Liquor shou'd pass thorough the Pores of those *Vesiculæ* or Membranes that environ it, more especially being continually forced upon and thrust out, by new Supplies from the Arteries or Ducts; as likewise the internal Heat which helps to perspire or evaporate these Fluids, into the Cavity where the Aqueous Humour is lodged. It may likewise be helped by the continual Motion, and squeesing of the Bulbe or Globe of the Eye; and all these may likewise contribute to send the same Humour out by the *Cornea*, which we see plainly enough it does, when it has not its Supplies, as by cutting an Eye out, and letting it lie a Day or two; the Aqueous Humour will be mostly evaporate, so that there needs no suppos'd holes in the Blood Vessels to return by, as some think. This Humour being let out by Puncture, very soon returns, as I have frequently experimented, so that there must be a very considerable Supply.

CHAP. VIII.

THEORY of VISION, considered with some of the Diseases of the Eye.

THUS having given a short Description of the Eye, that which seems necessary, and what I shall treat of next, is the Theory of Vision; how, and after what manner the Images of Objects are represented to us, by means of the aforesaid Organs of Sight.

I would not have the Reader expect that I am to write a whole Treatise of Opticks, but only so much as may be necessary to shew how Sight is performed.

And yet less necessary to my Purpose to philosophize on the Nature of Light, which however seems to be a subtil Fluid, that moves quick, and is continually emitted from the Sun or luminous Body: Its Motion may be observed by the Reflection on solid Bodies, and the Refraction it has in passing thorough a *Dense Medium*, such as Glass.

Light then is this *Materia subtilis* sent forth from the Sun, or lucid Body, in Lines or Rays, commonly called Sun-beams. The famous Monsieur *Romare* has calculated by the *Satellites*, that Light, or those fluid and luminous Rays, are transmitted from the Sun to us in ten Minutes time. These then coming with such an incredible Swiftness,

ness, meeting the Eye proper and wonderfully disposed with convex and diaphonous Mediums the better to receive them, cannot but strike very sensibly upon the fine medullary Fibres of the *Retina*. But whether it be communicated by Undulation or Vibration to the Soul, to make the Impression called Light, is what I shan't pretend to determine.

The Eye may be considered as a *Camera obscura*, or dark Chamber; that is, to shut the Doors and Windows of a Room, so as no Light come in but by a small Hole in one of the Shutters: Then place a White Paper (which may be supposed to be the *Retina*) within at a convenient Distance from the Hole, and the Rays reflected from the external Objects without will cross one another in the Hole, and paint the inverted Images on the Paper, though but faintly.

Thus then it would do upon the *Retina*, although there were no Humours, neither Chrystalline, Vitrious or Aqueous, nor even the *Cornea*, if there be but a small Hole, such as the Pupil, for the Rays to pass thorough, as in the *Camera obscura*; what the *Retina* might suffer in that Case is not to our present Purpose; so that all these only contribute to the greater Perfection of Sight; of which more hereafter.

For Example: A *Lens* (which may be supposed to be the Chrystalline behind the

Pupil) or convex Glaſs being placed betwixt the Hole and Paper, will make the Rays converge which before were ſpread in a large and confuſed Object; that is, the oblique Rays of each Pencil of Rays, that flows from every Point of the Object, will be refracted by the Denſity of the Glaſs Medium to their proper Perpendicular; and there meeting together much nearer to one another in the *Focus*, than at their Place of Incidence, muſt conſequently imprint there a leſſer Image, though much more ſtrongly, and perfectly delineate.

If the *Lens* or Chryſtalline be too far from the Paper or *Retina*, the Rays will interſect one another before they arrive there, and afterwards come devergent upon the Paper; ſo that being again ſpread, they will make but a confuſed and faint Image or Impreſſion: If it be too near, the Rays are not as yet met in their *Focus*, and then cannot be ſo perfect; thus the Paper or *Retina* muſt be at its proper Diſtance.

Theſe are commonly given as Reaſons for the two Diſeaſes called *Myopia* and *Presbitia*; although many Obſervations and Demonſtrations might be given to the contrary, and that it proceeds only from the too much or too little Convexity of the *Cornea* and Globe of the Eye; which is remarkable in purblind People, that the *Tunica cornea* is more eminently convex than

than in others; and the more it is so, the nearer they will see or hold the Object. The only Remedy for this Disease is the use of concave and menisscous Glasses, which make the Rays diverge, that otherwise are too much converged by the too great Convexity of the *Cornea*, and better to see things at a distance; these sort of Spectacles are used as I said before.

Presbitia in old Age being the contrary, that is too little Convexity, or Flatness of the *Cornea* and Globe, either by Nature or decayed, are only to be helped by the contrary Remedy, the convex Spectacles so well known, and are to be fitted according to the Decay or Convexity of the *Cornea*. As I have said then, the *Lens* or Chrystalline is to be placed at its proper Distance from the Paper behind the Hole in the *Camera obscura*, by which means the Rays are broke or refracted. The Reason of which is not much to my Purpose, whether by a proper Disposition of the Pores of the Glass or Medium, that break the Rays as a Ball thrown into a Tube; or whether it be by Attraction, as Sir *Isaac Newton* thinks: But that it is so few or none will deny, since it's demonstrable by so many Experiments. These Rays being brought then by means of this Convex to their proper *Focus*, or Place on the Paper, or *Retina*, must, as I have said, imprint a more perfect Image.

A *Convex of a larger Sphere being put a little on the Outside, will make a greater Number of Rays to converge from all Points of the external Object, so to enter in at the Hole upon the *Lens* in the Inside, and consequently make the Picture more perfect. The greater Convexity of the Glass or *Lens*, the larger the Object will appear, for the Angle of Vision will be greater, but the *Axis* of Sight, or distance from the Object, will be shortened; so that Purblind People, if they have no other defect or weakness but proceeding from the Convexity, see things better, and probably larger, than the others, yet at their own distance, which no doubt must be nearer according to the Convexity.

* *Which may be supposed to be as the* Cornea, *or as Spectacles.*

Thus much for the more perfect imprinting of Ideas or Objects by means of Convex Bodies.

Many Reasons have been given about the Nature of Colours, although Sir *Isaac Newton* seems to have fully cleared that Point, by many of his Experiments with Crystal and Glass Prisms, such as putting a Triangular one behind a small hole in the Shutter of a darkened Room, so that the Sun-beams or Rays fall upon it, by which means they will appear in different Colours on the other side of the Room, such as Blue, Red, Green or Yellow, by which he proves the different Nature of those

Rays.

Rays; as this is but little to my purpose, so I leave it. It may not be improper that I take Notice of the different Refractions the Rays suffer in the Eye, which is first in the *Cornea*, according to its Convexity, for tho' it is *Concavo convexe*, yet its Convexity is more than the Concavity, especially in Purblind People; so that they are gather'd by this first Convexity, and hinders their falling so much on the *Iris*, to pass the better through the *Pupil*, in order to fall upon the Humour Chrystalline, where they suffer a Refraction, and no doubt is the principal one in the Eye. By the Convexity and Density of this Humour, they are in such a manner gather'd together, and sent thorough the Vitrious, to unite altogether upon the *Retina*, where they imprint the Object inverted; nor are we from that to reason, that Objects shou'd appear Topsie-turvie to us, for the Soul considers not so much the Rays place, as from whence they come.

For Example, supposing there were only two Pencils of Rays to come from the Object of a Man, that is, one from some part of his Head, another from the Foot; the former then must strike upon the lower part of the *Retina*, by which I must certainly judge it comes from above. The other coming from below, must strike upwards, and consequently on the

the upper part of the *Retina*, and neceſſarily be judged to come from under.

I doubt if the Vitrious, as ſome think, any way changes the direction of the Rays, or diſtance of the *Focus*; for a *Lens*, or Convex, being placed at its proper diſtance, which we will ſuppoſe to be two Inches, and a ſolid Piece of Glaſs, or a proper Glaſs full of Water that lies cloſely to it, and two Inches in Diameter, the *Focus* will appear juſt on the other ſide, *viz.* two Inches from the *Lens* as before.

The learned Doctor *Pitcairne* proves the Seat of Viſion to be in the *Retina*; and that the *Muſcæ* or black Spots, Smoak, Threads, *&c.* that are ſeen by People troubled with Vertigo's, Swimmings of the Head, or the commencing *Gutta Serena*, comes from the Obſtruction or Turgidity of the Blood Veſſels of the *Retina*; and that it cannot be from any concreted or glutinous Particles in the Humour Aqueous, which it's true cannot be accounted for to appear on the *Retina* according to the Rules of Opticks; although there are ſome things pretty hard to be reſolved, which I ſhall take notice of within a little, it's plainly demonſtrable that the Convex Glaſs of a *Camera Obſcura*, or any other being all full of cracks, flaws, ſpots, or moſtly all over Sand or Dirt, but that ſome Light come in, the Object will ſtill

appear

appear fair, without the least Cloud or Spot in it, though perhaps a little more faint and not so bright, because there are not so many Rays that enter, but still there are such numbers that come from all Points of the Object, and enter at the unspotted parts of the Convex Glass, which still makes the Image perfect.

This seems to contradict Monsieur *Maitrejean*'s Opinion, that sometimes the *Muscæ* or Spots we see may be occasion'd by little Ulcers in the Chrystalline, or Inflammation of the Blood Vessels of the *Tunica chrystallina*; although it's true he generally agrees it to be in the *Retina*.

It's certain the Patients commonly troubled with Cataracts, especially the true sort, see those *Muscæ* in the beginning of the Distemper, which must be allowed by all conversant in that Disease, although there are some Exceptions from that Rule.

The *Muscæ*, or Spots, coming from a commencing *Gutta Serena*, Hysterick or Epileptick Distempers, which no doubt is in the Blood Vessels of the *Retina*, disappear as those Distempers go of, and are unconstant; but those attending Cataracts grow worse, and appear constant, 'till the Sight be gone, and then the Needle is the Remedy; and the Cataract being beat down, are not any more troubled with those Spots.

It's

It's true, there are certain *Muſcæ* ſeen by ſome conſtantly, and have had them for many Years. This I take to be a ſort of *Varix* in the Blood Veſſels of the *Retina*, proceeding from too great Application in Reading, Writing, or holding down their Heads, as I have generally obſerv'd by thoſe People who are troubled with them, which its true by ſtraining may grow worſe, but have not known any further evil Effect to follow this Diſeaſe, ſuch as Blindneſs.

The firſt ſort of *Muſcæ*, or Blood Veſſels of the *Retina*, are ſometimes Prognoſticks of *Gutta Serena*, or total Blindneſs, which differs from thoſe attending the laudable Cataract, in that the Patient is deprived of all Senſe of Light, nor can any Manual Operation be of effect there; but on the contrary, in the true Cataract are ſenſible of Light and Darkneſs, and to be helped by the Needle. It will be pretty hard to account for the Obſervations to be made in curdly Cataracts, ſuch as their ſeeing thorough a Sieve or different Holes, and this being couched which breaks in Pieces, and falls to the bottom of the Aqueous Humour; but by ſome violent Motion part of theſe curdly Particles ariſing again, are to be ſeen, and again vaniſh when ſettled to the bottom, as I have

ſaid

ſaid more fully in treating of that ſort of Cataract.

But whether to attribute the *Muſcæ* attending Cataracts to an Inflammation which happens to the *Retina* at that time, or ſomething particular in the Nature of the Rays of Light, is what I ſhall leave to be decided by others.

OF

OF THE DISEASES OF THE EYE.

PART II.

CHAP. I.

Of the growing together of the Eye-lids.

THE Eye-lids are ſometimes, as well as the Tongue and other Parts, tied or grown together by a Membrane, yet rarely the whole Eye-lids, but is commonly open towards the great *Canthus*; and at which Place a ſmall Directory is to be introduced betwixt the Globe and Eye-lids; then with a Lancet

 or

or Bistory the Membrane is to be cut betwixt the *Ciliæ* upon the said Directory: The Eye is to be kept open as much as may be, for fear of growing together again, and wash'd with warm Claret, or Rose-water and Honey.

CHAP. II.

Lagophthalmos, *or drawing up of the superior Eye-lid.*

THE Cause is a Contraction of the *Rectus* and Paralysis of the Orbicular Muscle of the upper Lid, and is most commonly occasioned by Burns or Wounds. Some pretend to make an Operation here by cutting the upper Eye-lid; but as I think it scarce curable, so I leave it.

CHAP. III.

Ectropion, *the lower Eye-lid falling down, or Inside out.*

THIS probably proceeds from the Relaxation and Weakness of the Orbicular Muscle of the inferior Eye-lid; for which Dorcils, or Rags dipt in warm Claret and Honey, or such like, may be tried; nevertheless, I think, a Machine

of Lead made on purpose for that Lid can be of greatest use, being wore for some time upon it.

CHAP. IV.

The Antoniatonblepharon,

IS a Relaxation or Paralysis of the *Rectus* and Orbicular Muscle of the upper Eye-lid; in which Case strengthning Fomentations are likewise to be used, although rarely cured; nor can cutting upon the Outside, as some pretend, have any good Success.

CHAP. V.

Of the Stayen, *or little Tumour call'd by the* Greeks Pisthia *or* Crithe; *the* Latins, Hordelium *or* Grando.

THIS is a little Push or Swelling which grows on the Edge of the Eye-lid; they may be treated all under the same Name, although oft-times much differing in their Nature one from another, some being of the Nature of *Phlegmon*, others and most part *Atheromatus*, and some *Oedematus*; the first sort may be brought to Supuration by roasted Apple, or Bread Milk and Saffron boiled to a Poultess, and ap-

applied at Night. The *Oedematus* may sometimes be discussed with the *Empl. de ranis cum Merc.* The *Atheromatus* kind, as well as *Grando*, which frequently has small Stones in it, must be opened with a Lancet, and afterwards dress'd with *Mell. Rosarum*; or if it be not enough cleans'd, wash with *Aqua Fallopii*, then dress with the *Mell. Rosar.* There is sometimes a very large incisted Tumour arises on the Eye-lids, and perfect *Atheroma*, *Steatoma* or *Meliceris*. It is not so safe to cut out the Cystis here, as in other Parts, by reason of the want of Substance; but may be open'd, the Matter taken out, and then dress'd with warm *Egyptiacum*; or if that should not consume the Cystis, it may safely be touch'd with the lunar Caustick, and heal'd with *Mell. Rosarum* and Yolk of Egg.

CHAP. VI.

Trichiasis, *or* Phalangosis,

IS either a double Row of Eye-latches, or the Hairs growing inward; when they grow in, they wound and hurt the Eye, so that an *Ophthalmia* frequently accompanies it. The best Remedy is to pull them out; for the Bulbs out of

which the Hairs grow ſtill remaining, is ſufficient to make them return; the Cauſe then being taken away, the Eye recovers it ſelf as before, in the mean time refreſhing *Collyriums* and the Univerſals are not amiſs.

CHAP. VII.

Pſorophthalmia, *or* Lippitudo.

THIS is occaſioned by a ſharp coroding Humour, which cauſes the borders of the Eye-lids to inflame, and ſometimes riſe into hard little Swellings, and in a ſhort time degenerates into ſmall Ulcers, which ſometimes renders common Pus, and other times a hard cruſty ſort of Scurf with Water, and ſometimes like Sand and Gravel; in this hard unkindly Scurf Emolient Fomentations are moſt proper, ſuch as thoſe made with Camomile, Roſes, Mallows, Linſeed, Fenugreek, *&c.* The little Ulcers may be cleans'd and heal'd with Claret, *Mell. Roſarum*, and a little *Egyptiacum*, or *Aqua Fallopii* and *Mell. Roſarum.* However this being healed, Care muſt be taken at the ſame time of the Univerſal Remedies, becauſe the Humour not having any Evacuation that way, may occaſion a greater Inflammation in the Eye, if not diverted otherwiſe.

CHAP.

CHAP. VIII.

Verruca, Ficus *or* Sycoſis.

THESE Excreſcences the Eye-lids are ſubject to, as well as the other Parts of the Body; and likewiſe the Inſide as well as Outſide of the *Palpebræ*. The beſt and ſhorteſt way is to ſnip them off with a Pair of Scizors, the Ligature being too painful and troubleſome; if you fear their growing again, they may be touched on the Outſide of the Eye-lid with the lunar Cauſtick, but that is not to be done on the Inſide; although you may venture to waſh there with a little Vitriol Water. If they ſhould be of a carcinomatous Nature, as ſometimes they prove, they are better let alone than tampered with. The true Cancer ſometimes affects this part alſo; nor is there much to be done in that Caſe, excepting Paliatives and the Univerſals, which may hinder its Progreſs for ſome time; though if but juſt beginning, ſmall and very moveable, it may be cut off.

CHAP. IX.

Sclirosis, *or* Durities Palpebrarum,

IS an Inflammation, hard and unkindly Tumour of the Eye-lids, which sometimes degenerates into *Schirrus*, and sometimes Cancer; in which Cases, as I have said, there is but little to be done; yet in the Beginning may be taken away, by Means of the Universals, and fomenting the Part with White-wine boiled with Linseed, Fenugrek, Chamomile Flowers, Roses, Mallows, Frogs, *&c.* and applying the *Emplast. de Ranis cum Mercurio.* The Eye-lids are subject to Impostumations, as other Parts, and may be treated much after the same manner; only Care must be taken not to bring it to too great Supuration, or to let the Matter be lodged there too long, because of the Thinness of the Parts, and Want of Substance, so that the *Palpebræ* might be destroy'd.

CHAP.

CHAP. X.

Ægilops, *or* Fistula lachrimalis,

IS occasion'd by a Tumour or small Abcess in the great *Canthus*, or Corner of the Eye; and when come to Maturation, and open'd, is generally called *Fistula*, although it proves not always to be so; that is, neither deep or callous, as *Fistulas* are. In this Case it may easily be cured by Mundificatives or Detergents, without the use of the actual Cautery, the Bone being no way affected. But in the true *Fistula*, where the Bone is carious, the best and surest way is, after a good large Incision, (according to the Direction of the Fibres of the Orbicular Muscle) to have the actual Cautery for that purpose to be applied to the Bone, once, twice, or thrice, as shall be found requisite to make the Bone exfoliate, or come away. The *Os Unguis* comes out entirely, because consisting but of one *Lamina*; but when the superior part of the *Maxilla*, which joins the *Os unguis*, is affected, as frequently it is, this Part exfoliates. The Matter which comes from the Bone, when carious, is blackish coloured, and of a stinking fetid Smell. Sometimes the Bone may be exfoliate by means

of a little Cotton dipt in Spirit of Vitriol, and applied upon it for two or three Dreſſings, with dry Cotton on the Top; after which the Oyl of *Guiacum*, or Powder of *Euphorbium*, is to be made uſe of, to bring away the exfoliate Bone, and the Wound cured by Abſterſives and Incarnatives. The *Caruncula lachrimalis* being ſwell'd only full of clear or ſerous Matter often cures of it ſelf; (ſo that unleſs it contain *Pus* is but little dangerous) for this being only a Stagnation of the *Lachrimæ* in that part, is ſometimes carried off by frequent ſqueezing with the Finger.

CHAP. XI.

Ecanthis, *or Excreſcence in the great Corner.*

THIS is a preternatural piece of Fleſh which grows to the *Caruncula lachrimalis*, proceeding either from a Superfluity of Nouriſhment to that Part, or the Remains of an *Ungula*, or from an ill-cured Ulcer. The more ſoft ſort may ſometimes be eat away with a little burnt Alome and Sugar-Candy in Powder; but the harder ſort is to be taken away by paſſing a Needle and Thread through the middle of it; and raiſing it up by the Thread, may be

ſnipt

snipt off with a Pair of Scizors, Lancet or Bistory, and dress'd with a little Tincture of Myrrh and Honey. This Excrescence may easily be distinguished from the *Caruncula* by means of its Colour.

CHAP. XII.

Pterygium, Unguis, *or* Ungula,

IS a membranous Excrescence, which for the most part begins in the great Corner of the Eye; they are commonly distinguish'd into *Ungula Membranosa*, *Varicosa* and *Adiposa*. The Membranous, otherwise call'd *Panniculus*, is a fleshy and nervous sort of Excrescence, and but rarely succeeds well in the Operation. The second is full of turgid and dilated Blood Vessels, and better let alone then touch'd. The third and most kindly, on which the Operation may safely be perform'd, is of a whitish Colour, and greasie or fattish sort of Substance. This, as well as the rest, covers part, and sometimes the whole *Cornea*, and runs betwixt the same and the outer Skin of the *Conjunctiva*. The Operation is perform'd after this manner: Take

a Needle flatted forwards, and purposely blunted at Point, for fear of wounding the *Cornea*; let it likewise be a little curv'd, and having put in a Silk or Horse-hair, the latter of which I think is best, pass it gently betwixt the *Pterygium* and *Cornea*, that is, by crossing the Eye as from one Lid to the other; then cutting off the Needle, take an end with each Hand, raise it a little, though not to break it, which is easie; then edge your Thread first towards one End, and then to the other; that is, towards the two Angles of the Eye; and having entirely separated it but at the two Ends, tie it in the middle; then cut one End, and afterwards t'other, dressing the Eye with a little Honey and *Vitriolum album*. If the *Pterygium* be but beginning, it may be carried off without the Operation with Powders, such as that of *Ærugo*, *Alumen ustum*, *Vitriolum album*, Sugar-Candy, *&c.* likewise the Gall of most Animals is much commended.

CHAP.

CHAP. XIII.

Of Albugo, *or the white Spot in the Eye.*

THIS may be reckon'd a little cold sort of Tumour in the *Tunica conjunctiva*, for sometimes it opens, is brought to Maturation, and heal'd without any great Pain. It may be consum'd or cleans'd with Galls of Animals, Oyl of Pepper, Honey with Vitriol, and such like. Some distinguish it into different sorts, as that which lies upon the white of the Eye, and other on the *Cornea*: This distinction signifies but little, for the same Remedies serve for either. Those who are but little Conversant in Diseases of the Eyes, may readily mistake, and take Ulcers or Cicatrises for *Albugo*, meaning very small Ulcers; but the Ulcer may be known by the many little Veins which are generally round it; as likewise the want of Substance may be seen if narrowly observ'd. The Cicatrise generally follows some Small Pock, Wound or such like in the Eye, which is not to be taken away.

CHAP. XIV.

Of Phlyctæna, *or Ulcers of the Conjunctive and* Cornea.

THESE are occasion'd by a sharp Corroding Humour, and are by Authors generally divided into many sorts, altho' I think they may be comprehended under greater, lesser, deeper, and more malignant; nor does the Method much differ, only in making the *Collyriums* more or less Mundificative, as the Ulcers require; they generally appear white in the *Cornea*, and red in the white of the Eye; they may be cleans'd with *Mel Rosarum*, and a little *Ægyptiacum* or *Erugo Æris*, or a *Collyrium* made of Rose-water, *Vitriolum*, *Alb. Alumen*, *Sacchrum Saturni*, and Sugar-Candy; as likewise the *Pulvis Nicotianæ*, *Ungt. tutiæ*, are sometimes of good use. After cleansing they may be dryed and heal'd with the *Troch. Alb. Rhasis* dissolv'd in Rose or Plantain Water, or Egg-shells and Sugar-Candy pulveris'd.

CHAP.

CHAP. XV.

Of the Carnous Excrescences.

THESE sometimes follow upon Ulcers or Wounds of the *Sclerotica* and *Cornea*, and may be consum'd by the use of a Powder made of Vitriol. *Alb. Alumen Ustum* and Sugar-Candy; or a little sublimate with Sugar, or ℞ *succ. fænic. Chelidon anna* ℥iij, *Aloes* ℈j, *fell. Anguill.* ℥ss, *sacchr. cand.* ʒj, *Vitriol. Alb. Mell. Rosar.* ℥ss, *Misce fiat collyrium.*

CHAP. XVI.

Of Ophthalmia, Fluxus oculi *or* Delachrimatio.

THE *Ophthalmia* is an Inflammation of the *Tunica adnata* or *conjunctiva*, which if slight, affects but the white: Yet when more violent, not only that and the *Cornea*, but likewise all this Membrane which covers the inside of the Eye-lids round the Globe, and even the *Pericranium* it self, from which its continued; and seems sometimes to be affected, as I've frequently observ'd upon the use of Repellents, or cold Medecines to the Eyes, which

which have occasioned a mighty weight above the Eye-brows and Forehead, when at the same time the Eye seem'd to be better.

The common *Ophthalmia* is generally occasion'd by Stroaks, Wind, Dirt, Dust, Fire, great Heat, or Cold; these for the most part are soon carried off, although sometimes degenerate into *Ophthalmia vera*, which however commonly proceeds from an inward Cause, and probably from a Viciation, or want of a due Secretion of some of the particular Glands of the Body, and these Humours not being separate, turn sharp and acid, as is to be observed in most troubled with this Distemper, being Bled, the Serous part proves very sharp to the Taste; and this generally occasions a greater Secretion, or Flux of Tears * from the lachrymal Gland by some call'd *Fluxus oculi* or *delachrimatio*. However, the *Ophthalmia vera* is sometimes dry, and most commonly in the Sanguine, Cholerick or dry Constitution where there is but little *Serum*.

* *For the Want of a due Secretion in some of the Glands must occasion greater in others.*

Another sort of *Ophthalmia* call'd *Chemosis*, is a heaving or blowing up of the *Tunica conjunctiva*, so that the *Cornea* in place of Convex seems Concave.

The common sort of *Ophthalmia* may be cured by the use of Simple *Collyriums*, with-

without much taking notice of the Universals; but in the *Ophthalmia vera* the Universal Remedies are more to be taken notice of; the *Collyriums* without (as I've frequently observed) rather doing harm; for by stopping the Humour, as I've said before (which wants to be evacuate) occasions that heavineſs in the Forehead, and falls down more vehemently in a few Days.

Diet is no doubt to be taken notice on, for which *Gordonius* says,

Hæc oculis multum, sol, pulvis, fumus & æstus
Ventus cum fletu, vina, venusq; nocent
Acria ne Mandas, nec quæ sunt plena vaporum
Nec cæpas, lentes, Allia, pira, fabas.

Although Wine no doubt is in most Cases prejudicial to the Eyes, yet I have found it very necessary in some Cases, where I could imagine it to proceed from crude and indigested Humours, especially in People of Age, or those much used to Wine.

The Universals are to be ordered as the Physicians or Surgeons shall find requisite, such as Purging, Bleeding, Glysters, Cupping, Bathing, *Errhines*, *Cucuphas*, *Diaphoretics* and *Diuretics*, Setons, Issues, Blisters,

Blisters, *&c.* although I must make this Observation on the latter, which is, that upon applying the *Epistpastics*, the Inflammation generally grows worse for the first Day or two, although perhaps better afterwards, which probably is as long as the Subtile Particles of the *Cantharides* remain in the Blood: However, I reckon it more safe, and rather chuse to use them in a common Inflammation than very violent one. There are some Observations on particular Secretions, which I have found very useful in these Cases. I'm however neither bold or willing enough to write my private Opinion on that Subject; but the ingenious will soon find it out. It is wonderful to observe the Sympathy betwixt the Eyes and Ear, and especially in this Disease, when oft times being repell'd by Medicines, or put back from the Eyes, falls upon the Ear, and occasions great Pain or Deafness or dullness of Hearing, and again the Ears growing better, returns to the Eyes. I know not if this may be reckon'd to proceed from the *Pericranium*, which not only seems to be continued to the Eye; but likewise to the *Tympanum*, or whether the fifth pair of Nerves may Sympathise in that manner, because its first Branches make the *Ramus* and *Plexus*

Ophthal-

Ophthalmicus, and likewise distribute to the Lachrimal Gland; it has also some of the branches of its third Ramification, which makes up the *Chorda Tympani*, joins with the *Portio Dura*, and to the Muscles of the *Malleolus*.

Common Colds, Disorders, or Obstructions of the Nose, likewise affect the Eyes, by reason of the affinity of the Parts, and for which Sternutatories are frequently of use.

The *Collyriums* are most frequently made up with the *Aq:*, *Rosar:*, *plantag:*, *fenicul:*, *Chelidon:*, *Euphraq:*, and *calcis*; Powders such as *Tutia*, *lap:-calaminaris*, *Troch:*, *Alb:*, *Rhasis*, *Sacharum Saturni Camphora*, *Testæ Ovorum*, *ossa sepiæ*, *Vitriol:*, *Alb:*, *Roman. Margaritum*, *Aloes*, *Alumen*, *&c.* Sometimes *Collyriums*, made up with Claret or other Wines, does very well; but as the Disease differs very much, so the particular Method or Remedy cannot be so well set down, but must be used according to the Age, Constitution and Nature of the Disease, which I leave to the good Judgment of the Physician or Surgeon. Mell. & lac muliebria.

CHAP. XVII.

Rhexis, *or the burſten Eye.*

THIS is occaſion'd either by a violent Blow which breaks the *Cornea*, or by an Ulceration of that *Tunica*; ſo that all the Humours run out, and often a Suppuration of the *Uvea* and *Retina* themſelves happens.

The Ulcers ſometimes begin externally on the outer Superfices of the *Cornea*, and ſometimes by *Pus* gather'd together under the ſaid Tunic.

As it is for the moſt part occaſioned by ſome violent Stroak or Blow, ſo generally the reſt, and other parts of the Eye, are contus'd and inflamed, for which reaſon it will be very proper to make uſe of the Univerſals, ſuch as Bleeding and Purging, and Pidgeon's Blood dropt in the Eye.

For outward Application Dorcels, or Rags dipped in Wine, white of Eggs, Oil of Lillies, with a little *Sacharum Saturni.*

For Laceration, or Wound in the inſide of the Eye, or Eye-lids, or *Cornea*, waſh'd with a little warm Claret and Honey, or Yolk of Egg, with Honey of Roſes, and Women's Milk warm. The Fomentations may be made for the whole Eye with the common

common Herbs boyl'd in white Wine, such as Lavender, Hyssop, Rosemary Flowers, Roses, Wormwood, Melilot and Chamomile Flowers.

Cicatrise with Shells of Eggs calcin'd in Powder, and *Tutia* prepared.

If a *Fungus* arise make use of the *Alumen Ust.* and white Sugar; or if occasion be, mix it with a little *Vitriolum Alb.*

Thus being cur'd, altho' the Crystalline, Vitrious and Aqueous Humors be run out; yet if most of the *Tunica Choroides* be remaining, that it is not wholly Supurate, the Globe will be supplied with a Watry Humour, probably the same with the Aqueous, which, as I've taken notice in the Description of those Parts, is carried into the Vitrious and Chrystalline, when as yet in the Eye; they are, as I have said, of a particular Structure, and no doubt in the first Formation.

The Globe, however, by Consummation and Cicatrisation of the Parts, rarely comes to be so big as formerly.

This Misfortune, no doubt, is a great loss to the Beauty of the Face, and the only help left for that is the use of an Artificial or Glass Eye, which is so naturally made by some, that 'tis scarce to be perceiv'd, and will turn to and fro as the Globe does.

CHAP. XVIII.

Synchisis, *or a Confusion of the Sight, Blood and Humours of the Eye.*

THIS might come in with the former, generally proceeding from the same Cause, such as Blows, only the *Synchisis* may be reckon'd the least Violent, or without Laceration of Parts, it's true the Violence of the Stroak nevertheless often times bruises the Vitrious Humour, or puts the Chrystalline out of its place, with Extravasation of Blood, and Inflammation of the Parts. These occasion violent Pains to the Patient.

The Method for Cure may be taken much as in the former for *Rhexis*, only abstaining from the Mundificatives, Absterfives or sharp Medicines being the most proper in Solution of Contenuity, which rarely happens in *Synchisis*; but if the Parts within should come to a Supuration, Ulcerates and Corode the *Cornea*, it may then properly be call'd and treated as *Rhexis*.

CHAP.

CHAP. XIX.

Of the Eye starting entirely out of the Orbit by Stroak or Wound.

IF there seems to be but a small Laceration, Relaxation, or Inflammation of the parts, it may be recovered by the use of warm Fomentations and *Collyriums*; but if it be almost entire, seperate, and out of the Orbit, it must be extirpated, and quite cut out, as altogether useless.

The Cavity of the Orbit may be filled with Dorcels dipt in Tincture of Myrrhe and Aloes with Claret and Hony; or if the Flux of Blood should be great, put with the Lint Powder of Bole Armenic, *Sanguis Draconis*, *G. Mastich* and *Tragaganth* equal parts; and above all white of Egg beat up with Alumn; or white of Egg, Oyl of Roses, Tincture of Myrrhe and Bole Armenic. *Some use dry Lint.*

The Universals, as Bleeding and Glysters, is not to be neglected, to prevent a Fever. It may aftewards be dressed with the *Linimentum Arcæi*, or *Terebinth*, with Yolk of Egg and Honey.

It may be Mundified and Cicatriced as other Wounds.

There must be care taken not to cause too great a Supuration, for fear of the Bone, which has but very little Carneous Substance to cover it.

CHAP. XX.

Of the more common or more slight Wounds of the Eye, or Dust, Dirt, &c.

WOUNDS of the Eye are rarely mortal, nevertheless they are frequently very painful, inflam'd and dangerous as to Loss of Sight. Healthful Bodies may receive slight Wounds in any part of the Eye, excepting the *Cornea*, and often escape without Loss of Sight; and even sometimes the *Cornea* it self may be slightly wounded, and the Sight remain, although this is rare, being for the most part the *Cornea* becomes Opac, which occasions Blindness; or the Cicatrise remains in the transparent Part of the *Cornea*, and obstructs many of the Rays; by this means the Objects are not seen so perfectly well.

Wounds then in the *Cornea* are the most dangerous for Loss of Sight of any of the external Parts of the Globe.

The Wounds in the *Palpebræ*, or betwixt the Globe and Orbit, are not so much to be fear'd; but those of its Muscles or Nerves are commonly very dangerous. In

In all Wounds or Diseases of the Eyes, where there is any Inflammation to be feared, the Universals, such as Bleeding, Purging and Glystering, are not to be neglected.

If there be any extraneous, sharp or pointed Bodies remaining or sticking in it, they may be taken out with a Pair of little Pincers.

Some make use of a stript Straw or a Feather.

If any rough little Bodies, Dirt or Dust, try to wash it out with a little warm Rose-water, or a soft Bit of Sponge, made fast upon the End of a Piece of Whalebone, and being dipt in Rose, Fennel or Plantan Water; having turn'd up the Eye-lid, go gently with the wet Bit of Sponge along the Inside to bring away what is troublesome.

Some make use of *Portuguese* Snuff with very good Success, to bring Dirt or Dust out of the Eye.

But having received a slight Wound in any part of the Eye, let some Drops of the Blood of a Pidgeon be put in, or of Woman's Milk, and let it be kept shut with White of Egg beat up with a piece of Allum clapt on the Outside, or Fomentations; neither is it proper to open it often.

In the Operation for couching the Cataract, I never make use of any thing to cure the Wound, nor open the Eye for at least eight or ten Days, in which time the Orifice is perfectly heal'd up.

In performing this Operation, the Aqueous Humour, or some part of it, often runs out, but is again supplied in a Day or two's time. I have frequently seen a great part of it issue out upon drawing the Needle out of the Eye, so that the Globe could visibly be perceiv'd not so full as before, which in a Day or two was again fill'd as formerly.

It's true however that if the Eye be much squeezed, and that the Aqueous Humour comes all out, the other Humours readily suffer; because by squeezing you may then more easily put them out of their Place, or swell or break the vitrious Humour; all which will prejudice the Sight, and make the Eye more full, or to swell or bunch out, as I've observed in such Cases.

For common Wounds in the Eye, a *Collyrium* made up with *Tutia* prepar'd, Myrrh, Aloes, Saffron and *Mell. Rosarum*, dissolv'd in Rose or Fennel Water, is very proper, especially after the first dressing with Blood of Pigeons, or Woman's Milk.

The

The White of Egg and Saffron, beat up with Oyl of Roses and Wine, may be laid on the Outside with Rags.

CHAP. XXI.

Of Hyposphagma, *or Ruption of the Blood Vessels.*

THIS is occasion'd by less violent Blows which only cause an Eruption, or breaking of the Blood Vessels, such as those of the *Conjunctiva*; the Blood runs betwixt the Membranes, causes Redness, and afterwards Lividness in that Part.

As I have said before, the Blood of a Pigeon, or Woman's Milk, is very proper at first, and afterwards a Water made up with *Sachar. Satur*; a little Camphire and Saffron dissolv'd in *Aq. Fenniculi*, and outwardly, as before; or White of Egg beat up with Rose-water; but if an Ulceration of the Parts should happen, it must be treated, as I've said in the foregoing, with mundifying *Collyriums*.

CHAP

CHAP. XXII.

Exophthalmia, *or the preternatural big Eye.*

IN this case the Globe of the Eye is swell'd to an extraordinary Bigness out of its Orbit, so that it cannot be cover'd by the Eye-lids without violent Pain there, as likewise in the Head, and sometimes accompanied with a Fever.

It's occasion'd by the violent falling down of a hot and sharp Humour, which swells the Vitrious, and augments the Aqueous Humour to a greater Degree than common, and likewise swells the other Parts within the Globe.

There is generally a great Heat and Inflammation in the Parts all round about. There seems to be another sort not so hot and sharp as the former, and comes on more slowly, but swells to an extraordinary Bigness out of the Orbit.

This violent Swelling of the Globe causes such a Stretching and Extension of the Muscles and Nerves, as to occasion that terrible Pain and Dolour. Whether this comes suddenly or slowly, it often times remains in that Condition for a long time, nor does the Eye recover it self to its former

mer Bigness but very rarely, as likewise the Sight is commonly lost.

Sometimes the Humour is so very violent, hot and sharp, that it destroys all the Parts within, and comes to Supuration. This is accompanied with most intolerable shooting Pains, so that I've known the poor Patient even weary of Life.

Upon Supuration the *Cornea* is coroded, and being open'd, the supurate Parts run out; and when cleans'd, the *Cornea* cicatrizes, but the Eye generally remains less than the natural Bigness.

It's true sometimes, without coming to Supuration, it recovers it self to the natural Bigness, or more commonly less than before.

Whether this be by the Humours returning by the Blood Vessels, or whether by Transpiration through the Tunics of the Globe, is what I shall not determine, although I think the latter seems the most probable.

The Sight however, as I've said, is lost; for probably by the violent Extension and Tumefaction of the Parts in and about the Globe, the Blood Vessels of the *Retina* suffer in the same manner as in *Gutta serena*, so that the Sight must be entirely lost.

The Cure depends much on Evacuations, such as Bleeding and Purging, likewise Cupping

Cupping behind the Neck is of very good use. *Epistpastics* behind the Ears, and *Setons* or Issues behind the Neck or on the Shoulders.

His Drink small and Diet cool and regular, as the Physician shall prescribe.

For outward Application, Rags dipt in White of Egg, beat up with Rosewater and some Grains of *Sachar. Saturni.* This is better to be applied warm than cold, because the Pores are more open'd by that Means, and consequently give more free Passage for the Humours.

Upon the declining, toasted Apples beat up with White Wine, Saffron and a little Camphire is of very good use.

If this Method succeed, nevertheless the Sight, as I've said, is generally lost; or if any remain, is much worse than before.

But if this Method should not succeed, and that it tends to Supuration, a Poultess of White Bread and Milk boil'd up with Saffron may freely be made use of, and applied warm to the Eye.

When it is come to Supuration or Maturity, the *Cornea*, or Part most enclining to break, may be open'd with a Lancet, without staying till it breaks; after which *Collyriums*, as formerly prescribed, may be made use of.

CHAP.

CHAP. XXIII.

Atrophia, *or Decay of the Eye.*

THIS is occasion'd for want of that due Nourishment to the Globe and Humours of the Eye; by which means it diminishes, and the Sight is either entirely lost or much weaken'd.

The Cause probably is Obstruction or Destruction of the Vessels which nourish the Parts, either by Strokes or sharp Humours; so that the Blood cannot pass, or the Humours be secern'd to the Eye as formerly. It frequently happens after the Cure of the *Exophthalmia.*

The Cure of this Disease is attempted by some with the use of Errhines, by which means the Parts are irritated, and the Humours forc'd down; as likewise the use of Fomentations, and a good, clean, healthy and nourishing Diet: However, as I look upon it an incurable Disease, so I leave it.

CHAP.

CHAP. XXIV.

Hypopyon, *or an Abceſs of the* Tunica Cornea.

IT's an Impoſthumation or *Pus* gather'd together betwixt the *Laminæ* of the *Cornea*; it's true, the *Pus* is ſometimes got under that Tunic, the Abceſs being open'd inwardly, and is ſtill term'd *Hypopyon*.

It is either cauſed by a hot and ſharp Humour flowing to the *Cornea*, or by Strokes which occaſion Impoſthumation of that Part.

It differs from *Phlyctena*, in that the former is properly an Abceſs with good digeſted *Pus*, and the other a little Puſtle only on the Superfice of the *Cornea*, and turns to a ſmall Ulcer with indigeſted thin Matter.

This Abceſs or *Hypopyon* is generally follow'd with loſs of Sight, either by means of the Cicatrice, or deſtruction of the Parts about it.

The Abceſs of the *Sclerotica* likewiſe comes under this denomination, although leſs dangerous.

If the *Hypopyon* be very ſmall, and the Humour not very violent, ſome Sight may ſtill

still remain, even after the Operation, although there will still remain a Cicatrice which necessarily impedes the same.

And the nearer the Abcess is to the external Superfice, the less dangerous it will prove.

As to the Cure, it may first be try'd by Evacuations, Repellents, and Discussives, or the Method be taken much as in *Ophthalmia*; but in case this should not succeed, which rarely it does, then recourse must be had to Manual Operation, and may be perform'd in this manner.

Let the Patient be placed in a convenient Chair, or in his Bed, his Head to be supported by an Assistant, who at the same time may draw upwards the Skin and frontal Muscles, after which some make use of the *Speculum Oculi*, altho' I rather chuse only my Finger and Thumb to keep the Globe fix'd and the Eye-lids open; then taking a small Lancet, I make my Aperture according to the bigness of the Abcess.

It is to be open'd in the inferior or lower Part where it inclines most to break, nor does the *Pus* always immediately follow, because it's generally very thick, but comes out soon after as the Wound opens more.

It may be cleansed with prepar'd *Tutia*, Aloes, Honey of Roses, White-wine and Fen-

Fennel-water. *Galen* tells us of one *Juſtus*, who uſed to cure the *Hypopyon* by a ſudden and rude ſhake, by which means the *Pus* went down to the bottom of the Aqueous Humour.

No doubt, if ſo, the Abceſs has been more inclin'd to break inwardly than otherwiſe, and which rude ſhake has readily effected it, ſo that the *Pus* going inwards, might fall to the bottom of the Aqueous Humour.

And this *Pus* ſometimes hardens when it is not of a malignant Nature, and remains ſo without any other Diſorder to the Eye.

I have known an Impoſtumation to happen in the *Iris* after a violent Stroke, ſo that the white Matter was plainly to be ſeen upon the *Iris*, although that ſide of it was ſhrunk and the Pupil leſſen'd there, yet on the other ſide perfectly well, ſo that the Patient ſee; but as it were halfly, or that ſomething were before half his Sight; the *Pus* it ſeems has harden'd, and remain'd ſo for many Years. Of the Diſeaſes of the *Uvea*, more hereafter.

***

CHAP.

CHAP. XXV.

Of the Abcess or Imposthumation of the Uvea *and* Choroides.

WHEN I speak of *Uvea*, I mean only that behind the *Iris*, because sometimes that Part called the *Choroides* is by some called *Uvea*: An Abcess then or Inflammation in the fore Part, or properly betwixt the *Uvea* and *Iris*, it may be perceived in at the transparent Part of the *Cornea*, but when in the *Tunica Choroides* is not perceptable, and can only be gues'd at by the violence of the Pain, and prejudice of the Sight, although this is but conjectural. If it should not come to Supuration, the Eye readily recovers it self as before, but if it comes to Supuration, the *Pus*, as I have said in the foregoing Chapter, being Kindly, and not Malignant, may come out or harden; it oftentimes precipitates to the bottom of the Aqueous Humour, and does no further Damage.

But that of a Malignat Nature oftentimes corrupts and destroys the whole Eye.

Evacuations and cooling *Collyriums*, such as in *Ophthalmia*, are first to be made use on, but if they should not be Effectual, and that it will Supurate; to quicken it,

and eaſe the Pain, make uſe of a Poultiſs or Cataplaſm of Bean-flower, Camomile, and Melilot-flowers, Fenugrec, Linſeed, and a little Saffron boil'd in Milk; if the Corruption break through the *Cornea*, it may be treated as *Rhexis*; but if the *Uvea* ſhould come through the Overture of the *Cornea*, it is then called,

CHAP. XXVI.

Staphyloma, *or falling out of the* Uvea.

THIS is commonly cauſed by Putrid and Malignant Ulcers of the *Cornea*, or by Strokes or ſharp Inſtruments, ſo that this *Tunica* being broke, the *Uvea* falls out, and receives Names according to the Figure it makes, as *Staphyloma*, like a Grape or Melon, or an Apple; or *Helos*, or *Clavus*, like the head of a Nail; *Myocephalum*, as the head of a Mouſe, theſe are alſo by ſome called *Proptoſis*.

In the beginning of this Diſeaſe, it may ſometimes be cured or hindred from growing worſe by cicatriſing *Collyriums*, ſuch as Claret, *Mel-Roſarum*, and *Trochiſ. Alb. Rhaſis*; although if the Ulcer be very foul, it will be very proper to make uſe firſt of a more mundifying *Collyrium*, but if this ſhould not prove effectual, that it grows worſe,

worse, or has already been of an old standing, recourse must be had to the Operation, and may be perform'd after this Manner.

The Surgeon being plac'd in a Chair, let the Patient sit betwixt his Legs upon the Ground, with his Back towards him.

And putting his Head backwards upon the Surgeon's Knee, the Operator is to tie it with a single Thread, if the Basis be small, but if large and broad, he shall pass a Needle with a double Thread through it.

And taking the two ends of the one Thread tie it above, and do the same with the others below, so strait as that it may decay and putrifie, which it readily does in a few days time.

Nevertheless, the Aqueous Humour generally runs out after it comes to Supuration, so that I think the Lancet does as well, commonly speaking, and less painful; as soon as the Aqueous Humour is let out, the *Uvea* shrinks, and again retires it self into the Eye.

After that, as I have said, the Mundifying and cicatrising *Collyriums* are to be made use on.

CHAP. XXVII.

Mydriasis, *or preternatural Dilatation of the* Pupille.

THIS is an extraordinary Dilatation of the *Iris* and *Uvea*, so that the *Pupille* becomes very large and wide; this is commonly taken to be a Disease of the *Uvea*, although it's certainly one of the Vitrious, and that the Symptom of it; for the Vitrious Humour being tumify'd or swell'd bigger than it's usual, will press upon the sides of the Globe which helps to dilate the *Pupille*, and will also force the Christaline Humour forwards, and the same coming to touch the *Uvea* will likewise contribute to the Dilatation of that *Tunic*.

This will also cause a confused sight of Objects at a distance, as they are commonly troubled with who have that Disease.

It is very difficult to Cure, but the most proper Method is good Dyet, abstaining from what is Vaporous, Bleeding, Cupping, Purging, and such like Evacuations. *Rhasis* and other Authors advise Kids Galls, Pigeon's-blood, and *Collyriums* to be made use of in the Eyes for this Disease, altho' in my Opinion can be but of little use.

The Decoction of Sarsa will be more useful.

CHAP.

CHAP. XXVIII.

Of the preternatural Contraction of the Pupille.

THIS may either be a Vice of the *Uvea* it self, or by Viscous and bad Humours in the Aqueous, as in the Malign Suffusion or Cataract, which probably clog and go in betwixt the Interstices of the Fibres of the *Uvea*, so as to hinder them from contracting or acting as they should do; it is a certain Symptom and always accompanies this sort of Vicious Cataracts. In fine, from whatever Cause the Contraction of the *Pupille* proceeds, Medicines are of little use, for which I shall leave it, and treat of

CHAP. XXIX.

Nyctalopia, *or Night Blindness.*

IT is more to be known by the Account we have from the Patient than any thing to be perceiv'd by us, the common Symptoms are these; the Eye seems no way affected, and sees tolerably well in the Day-time, but with greater difficulty as the Light

decreaſes, ſo that when dark they cannot ſee at all, or even with Moon-ſhine.

It is certainly a Defect in the *Retina*, whoſe Medulary Fibres ſeem to require a ſtronger Vibration from the Rays of Light than common; but whether this proceeds from viſcous Humours or Defect of the Spirits is what I ſhall not pretend to determine.

But it is to be obſerved, that in old People, or where it is of long ſtanding, is ſcarce curable.

If there be Plenitude Bleeding and Purging is very neceſſary, as likewiſe Veſicatories behind the Ears and Neck, after which the Decoction of the *Sarſa* and *Guiac* is of very good uſe.

CHAP. XXX.

Hemeralopia, *or Day Blindneſs.*

THIS is quite contrary, for the Patient cannot ſuffer Light, and often accompanied with great Pain, and as it grows darker ſo he ſees beſt; this ſeems to be an Inflammation of the *Retina*, or its Fibres too much extended, that the Light is too violent, or makes too ſtrong a Vibration; in ſhort, it's generally cauſed by *Opthalmia*, or other Diſeaſes of the Eyes, or Head,

Head, so that its Cure is not particular but depends upon the others, such as *Opthalmia*, violent Head-ach, Wounds of the Head or Eyes, Abcess or Ulcers of the *Cornea*, &c.

CHAP. XXXI.

Of Amaurosis, *or* Gutta Serena.

THIS is commonly called an Obstruction of the *Optic Nerve*; Monsieur *Maitre-jean* compares it to a sort of Paralisie of that Nerve, as happens to the other Organs or Parts of the Body; but the ingenious Dr. *Pitcairn*, in his *Theoria Morborum Oculi*, shews it to be an Obstruction of the Blood-Vessels of the *Retina*, so that when it is not yet confirm'd, (but commencing) or only some of the Blood-Vessels of the *Retina* obstructed, it is then the *Muscæ* appears, or black Spots, Clouds, or Smoak.

It is sometimes occasioned by a Compression of the *Optic Nerve*, by reason of some Tumour growing thereabouts, or by Contusion, Wound, or bruis'd Blood in those Parts, so that it proceeds sometimes from an Internal, sometimes an External Cause.

It either comes by little and little, or suddenly all at once; it often seizes but one Eye, other times both, and this without any external Appearance to the Bystander, the Eye seeming well, although there is a total depravation of Light, and the Pupil is as usual, neither much dilated or contracted. *Nyctalopia* or Night-blindness is distinguishable from the former, in that there is still some Sight remains, and can see Objects, tho' confusedly.

As to the Cure, some of the Antients as well as Moderns have pretended to it, and some of the latter, and of our most famous Physicians, advise the use of *Mercury*, some by Purging it off next Morning, others by putting the Patient under an entire Salivation; I shall only say, that many good Reasons might be given against this Practice, and that I have known several, (which I could name were it proper) that in a commencing *Gutta Serena*, by taking this Method, was confirm'd and wholly Blinded, but never knew any cured. Monsieur *Maitre-jean*, who seems to have had great Experience that way, leaves it, and says, it's seeking out the Philosopher's Stone, for that it's incurable.

It's true, I have known our famous Oculists here in *London* pretend to have cured a *Gutta Serena* in twenty four or forty eight

eight Hours; but I am sorry I must say, that I am persuaded none of these ingenious Gentlemen know that Disease; from the Dimness follows *Scotomia*, or from *Nyctalopia* or the Dilatation swelling, or Extention of the Vitrious Humour.

As I never knew any cur'd of the true *Gutta Serena*, so I shall not set down any Method, but leave it to the Authors and Practitioners, who shew its Cure as plain as that of a Whitloe.

CHAP. XXXII.

Of the Preternaturnal Extention of the Vitrious Humour.

AS all Parts of the Body are subject to Diseases, so no doubt the Vitrious Humour is, though but little taken notice of by Authors; a Disease proceeding from an internal Cause, is readily occasioned by viciousness of the Fluids, or too much or too little flowing to the Parts.

In this Case then there seems to be too great a Flux of Humours into the Body of the Vitrious, which it swells, dilates, or extends beyond its usual, and consequently forces the Christaline forwards, by which means Vision becomes more imperfect, and as it augments so the Sight must lessen; this

See the Description of the Humour Vitrious.

this by its Extention and preſſing upon the *Tunica Choroides*, makes the *Uvea* to Dilate, or widens the Pupil, being a conſtant Symptom of this Diſeaſe, and is ſtill made larger if the Chriſtaline forces forward upon the *Uvea*.

The Cure conſiſts in Bleeding, Purging, Cupping, Iſſues, and ſuch like Evacuations, a dry Dyet, and the Decoction of *Sarſaparilla*, *Saſaphr.* and *Guiac*; it's a good ſign when the Sight grows better.

If it be nothing but the pure Humour, which fills the little Celules of the Vitrious being too Viſcous, which occaſions its Dilatation; it is not ſo dangerous as when of a Vicious and Malign Nature, in which caſe the Chriſtaline likewiſe ſuffers, and a total Deprivation of Sight follows.

This Diſeaſe, as I have ſaid, is frequently taken for *Gutta Serena*, and ſeems to have been miſtaken by the Antients as well as Moderns, for *Sennertus* deſcribes it as a Diſeaſe of the *Optick Nerve*, and ſays, *Cognoſcitur hoc Malum, quod Oculi planè Clari apparent Nihilque vitii in iis animadvertitur, Niſi quod Pupilla Nigrior, & amplior apparet.*

Chap. 39. *Book.* I. *Vol.* III.

Which are properly ſigns of Extention of the Vitrious Humour, and not of *Gutta Serena*, as I have ſaid before.

CHAP.

CHAP. XXXIII.

Of Hypochyma, Suffusio, *or* Cataract.

IT has always been the Opinion of the Antients, and most of the Moderns at this present time, that the Cataract is nothing else but a Viscous, Tenacious, or Glutinous Matter, gathered together in the Aqueous Humour of the Eye, where, by length of time, these small slimy Fibres are compacted and hardened into a Species of *Pellicula*; some have described the Place of its situation in one part of the Aqueous Humour, some in another; neither of which Opinions is sufficient, since it differs according to its Nature, however, generally they are seated betwixt the *Uvea* and the *Christaline*, or indeed, rather immediately lying upon the Lense, this I think may be said without Exception of the true sort, or those which are to be Couched; but it's certain likewise, that there is a Malign sort of Suffusion which mixes with the whole Aqueous Humour, and in this case there is nothing to be done.

There are, however, lately some new Practitioners that give us a quite different Account of this Disease, especially Monsieur *Brisceau* of *Tournay*, and *Maitre-jean*

jean of *Paris*, having both writ againſt this common Opinion, and although theirs ſeems abſurd at firſt View, yet who reads them, eſpecially the latter, will find that he underſtands both Anatomy and Opticks very well; he poſitively affirms by many Obſervations on dead Bodies, who had Cataracts, that the ſame is a Diſeaſe, and an alteration of the very Chriſtaline Humour it ſelf, which waſtes, decays, and becomes Opack, and is the very Body of the Chriſtaline that is couch'd or beat down in the Operation.

This ſeems very ridiculous at firſt View, and there is immediately accuſed of not underſtanding Opticks, although, as I ſaid before, who reads him will find the contrary; I will not however affirm his Opinion to be true, but ſhall give a ſhort hint of it, and afterwards my Sentiments and Obſervations upon the ſame.

In his Deſcription of the Organization of the Eye, he conſiders the uſe of every one of its Parts in particular, and the nature of Viſion by ſeveral Experiments in Opticks, and ſhews, that Images of Objects are painted on the *Retina*, without any Convex Glaſs or Chriſtaline, which no doubt is only to make the Objects or Sight more perfect, as may be ſeen in my Theory of Viſion.

Nor

Nor is he the first of that Opinion, for the famous *Plempius* of *Amsterdam*, in his Fourteenth Chapter and Third Book, where contrary to the common Opinion, that Vision was form'd in the Humour Christaline, he says, *Dicam ne vero etiam omnibus inopinatum quidpiam? Aio enim vero cristallinum non Nobiliori in Oculo fungi officio quam aqueum & Exempto cristallino oppletoque loco ab humore vitreo visionem. Nihilominus celebratum iri. verum non tam distinctæ, quam nunc confusa enim esset in retiforma pictura, nisi alio situ, quam quem nunc obtinet, retiformis locaretur.*

It's true, he agrees with the common Opinion in Cataracts, however Monsieur *Maitre-jean* says, that this learned Author shews himself to have had a perfect Knowledge in the Theory of Optics, but that he wanted the Practice in Couching, and the Observations on such Bodies as he had made.

Galen seems to favour this new Author's Opinion, in his Twelfth Chapter *de Oculis*, where speaking of the Cataract, he says, *hujus aquæ color est diversus; quædam enim aëri quædam vitro æmulatur, alia est quasi album habens colorem, alia quasi cœli colorem, alia quasi viridem, alia quasi venetum; unde antiqui Cataractas, veneticos*

veneticos oculos appellerunt sed differentia est, quia venetici duobus modis fiunt vel propter aquam, si nimium fuerit coagulata; vel propter sivitatem quam patitur Christallinus.

However, *Galen*'s Opinion was, that there could be no Sight but by means of the Christaline; our Author likewise cites *Oribasius*, in his Forty Seventh Chapter and Eighth Book, where he says, *Glaucoma & suffusionem veteres unum eumdemq; morbum esse existimarunt*, &c. speaking of *Glaucomas*, and that seems still more to favour his Opinion; those who are more curious may see his Book, where they will find his Mathematical Reasonings in full, my Design being only to take Notice of them so far as necessary, to make his Observations be received a little more favourably in the World, or at least to suspend condemning of him till we our selves have made more Observations to prove the contrary.

Monsieur *Amien*, Surgeon of the Hospital in *Flanders*, seems to confirm this same Opinion, by an Observation or Dissection he made upon the Eye of one who died having a Cataract, which he told me he found to be the very Christaline Humour it self.

Monsieur *Maitre-jean*, after having examined whether the Christaline be absolutely

lutely necessary to see, which by Experiments with the *Camera Obscura*, it is not; as we have said before, but only for the more perfect Sight, and that being allow'd, that a faint Image is painted without any Convex or Glass, by the hole in the *Camera Obscura*; he shews that it will be much more perfect in an Eye where the Christaline is beat down or put out of its Place, although never to see so perfect as with it, and makes use of that Observation, of those who are Couched never to receive their Sight to such Perfection as before, which is true, although I think some other Reasons may be given for that, and which I shall take notice of more hereafter.

Thus then, as he says, the *Rays* being gathered together and refracted by the Convexity of the *Cornea*, makes the Image more perfect, and the *Rays* by this means being so much gathered as to cross in the *Pupil*, go on their way, till in place of meeting with the Humour Christaline (which he supposes to be beat down out of its Cavity of the Vitrious) meets with the said Vitrious, whose Cavity he says becomes Convex, partly by the softness of its Body, and partly by pressure of the Christaline on its side when out of its Place, so that it becomes almost as Convex as the Christaline; the

the *Rays* then meeting with the Convexity of the Vitrious are there the second time Refracted, and brought nigher the Perpendicular or Axis of Vision; although not to meet in a just Point as with the Christaline, which is the Reason he alledges for their not seeing so well as formerly, nor can the soft *Medium* of the Vitrious make such a strong Refraction of the *Rays*.

He seems to have been at a great deal of Pains, both as to Theory and Observation, and answers most Things that may be advanced against him.

When he treats of the Nature of Cataracts, he divides them in so many Classes, curable, and incurable, but concludes, that they are all a Disease of the Christaline, or Vitrious and Christaline together; and adds the *Glaucoma*, commonly taken for a Disease of the Christaline, is properly that of the Vitrious; nor does he deny the Cloudy or Viscous Humour which hardens, so commonly called Cataract, but says, it is occasioned by the Disease of the Christaline that makes it to decay and diminish, altho' at the same time it seems to grow bigger, by means of that Musilagenous or Glary Substance which grows about it; he calls this its Companion, or Appendix, and that the Christaline and it are both Couched; the more fibrous, big, and old this Appendix is, the more Unsuccessful, he says, the Operation

ration will prove. To confirm this Opinion, he gives a wonderful many different Observations, both upon living and dead Bodies.

The Cataract begins, and is frequently accompanied with violent shooting Pains in the Bottom of the Orbit and Forehead, which seem to be something of the Nature of Rheumatism.

The Humour falling upon the Eye, the Sight first begins to diminish in one or both; after which they are commonly troubled with those *Muscæ*, or Resemblance of Hairs, Threads, Smoak, Clouds, Dust or Cobwebs; and these seem to be in the Aqueous Humour, and not in the *Retina*, as I've said more fully in my *Theory of Vision*.

However neither of these are certain Signs of a Cataract; for the Sight may be diminished by other Causes, or these Imaginations may sometimes be in the *Retina*, although there is great Presumption of Cataracts when both are together; and as the Suffusion increases, so the Sight decreases.

There are many sorts of Cataracts, which differ both in Colour and Quality, such as the White, the Blue, the Pearl-colour, Ash-colour, Green, Yellow, Black and Brown.

All which Colours seem to proceed from the different Nature of the Humours.

The Cataract best esteem'd for couching is the White Pearl Colour, or a little upon the Blueish, or the White that inclines something to the Green, as likewise the Whitish Grey or Ash-colour.

Those which are perfectly White likewise succeed, but the Cataract frequently rises up again after couch'd.

The Iron-colour'd or brown often succeeds well, although frequently strongly adherent to the *Uvea*, which make them the more difficult to couch.

Those that are clear, shining or Silver-colour'd are commonly false, as likewise those that are very Yellow or Green.

As also the Black rarely succeed.

If the *Iris* seem to be any way faulty, or does not dilate or contract with Light or Darkness, it is a very bad Sign; or if the Globe of the Eye be either less or more than common.

If the Patient be subject to violent Pain in the Head, the Operation rarely succeeds well, especially having been during the Growth of the Cataract, and still continuing after it's come to be ripe.

Those coming by Strokes, or any external Accident, are for the most part dangerous, and not to be meddled with.

The

The younger the Patient is, if at a reasonable Age to undergo the Operation, the more successful it may be expected to prove.

There is as yet a sort of Cataract call'd *the Milky*; which I take to be nothing else but the White sort not come to its Maturity; for when it turns old, it proves to be the White, or Snowy-colour'd. This, if touch'd with the Needle before it be ripe, immediately mixes with the Aqueous, which makes it turbid all over, so that the Operator will scarce see the Point of the Needle.

The Matter seems to be contain'd in a Bag, or else betwixt the Christaline and its Coat, or *Tunica Aranea*.

Which when prick'd, or broke, as I've said, immediately mixes with the Aqueous.

There is as yet another sort of these that's older, although not altogether ripe, and seems as curdled when broke; before it be touch'd it looks to be uneven, as if made up of lighter and darker Parts, nor do they sometimes seem to be well join'd, so that the Patient often sees as through a Sieve, or other times as if through a Hole, which is sometimes in the middle.

When this sort of Curdly Cataract is touch'd, as I've said, it breaks all in pieces

in the Aqueous Humour, but ſoon ſettles to the bottom, and the Sight proves clear.

Thoſe who have been couched of that ſort of Cataract, are ſometimes troubled with the ſeeing of *Muſcæ*, or black Spots, eſpecially upon violent or ſudden Motion of the Head; and that no doubt proceeds from ſome of thoſe ſmall Curdly Particles ariſing up again in the Aqueous Humour, which ſoon after ſettle as before, and are not then to be ſeen.

This ſeems evidently to prove things being ſeen in the Aqueous Humour, of which I have ſaid enough in the *Theory of Viſion*.

There is another very common ſort of Cataract, which may properly be called a Malign Suffuſion. Monſieur *Maitre-jean* ſuppoſes it to be an Abſceſs of the Chryſtaline Humour it ſelf; but whether it be or not, it commonly makes the whole Aqueous Humour turbid, the *Uvea* loſes its Contraction and Dilatation, the Colour of the *Iris* decays, and in a Word it's incurable.

When the Cataract is come to the full Ripeneſs or Maturity, and that it's of the true kind, the only Remedy then is the Needle; the ſight of Objects is now gone, but ſhadows of Light and Darkneſs they are ſtill ſenſible of; if otherwiſe, there is but

but little hope of succeeding; the common ways of tryal is to shut the Eye, and rubbing it a little with the Finger, immediately open it to the Light, and observing the Pupil to contract it self is a good sign.

Although this Method is frequently used, yet I see no reason for rubbing; another way I think as good, such as putting the Hand before the Eye, and suddenly taking it away, or putting the Patient in a darkish part of the Room, and bringing him nearer to the Window or Light, and the Pupil contracting as I've said, is a good sign.

By the Contraction and Dilatation of the Pupil, it may be judg'd that the Cataract has not affected the *Uvea*; as likewise, that the *Retina* or Optick Nerve does not suffer.

If the Pupil contracts but slowly, it's a token of its being old, and if of a very long continuance, the couching is very difficult, because the Cataract is so harden'd, and fast to the Parts all round about, that it's scarce to be loosened with the Needle.

If the *Uvea* have lost its Contraction and Dilatation, it's a very bad sign.

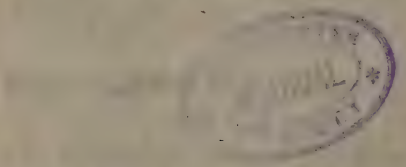
As the rugged and uneven Cataracts are not so good, so those more smooth and even are best.

But if very ſmooth and ſhining like poliſh'd Horn, it's likewiſe a bad ſign.

When aſſured of the Goodneſs of the Cataract, it's proper that the Patient be kept to a clean, ſpare, and light Diet before the Operation, as likewiſe the Uſe of gentle Lenitives or Glyſters, and Bleeding if Plethorick, ſo that the Body being in a good Temper, the Inflammation will be the leſs after Couching.

If the Patient be of a ſpare or thin Body, Bleeding and Purging is not ſo neceſſary.

The Months of *May* and *September* are reckon'd moſt proper for Couching, and rather to chuſe clear ſerene Weather than any elſe, as indeed is moſt proper for any Operation; it's true, our common Oculiſts neither obſerve Time nor Weather, or Bleeding, or Purging, although this is the regular way, nor needs Time be always obſerved if the Cataract be full ripe.



CHAP.

CHAP. XXXIV.

The Manner of Operation for the Cataract.

AFTER having prepar'd the Body as aforesaid, chuse the Time of the Day, about Ten a Clock, and for the Place, let it be a Chamber of a good Light, although Sun-shine makes the Pupil contract it self too much, and is too suddenly strong for the Eye, when the Cataract is beat down; then two Chairs being plac'd, one for the Patient, another for the Operator, or a long Stool or Seat on which both may sit, the Patient with his Face towards the Window or Light, (or rather a little obliquely) and the Operator with his Back to it.

The Eye that's well ought to be ty'd up, because upon its Motion, or that of one Eye, the other generally does the like; then an Assistant having placed himself behind the Patient, let him put both Hands upon his Forehead, at the same time drawing the Skin and frontal Muscles a little upwards, the Head may be turn'd a little backwards, leaning upon the Assistant's Breast.

The Operator then is to ſit as near as his Knees will ſuffer him, and making the Patient turn his Eye towards the Noſe, put back the Upper-lid with your Finger, and the lower one with the Thumb, and at the ſame time keep the Globe of the Eye firm and ſteady.

And having choſe your Needle, of which ſome are of one form, and ſome of another, the round being what are frequently made uſe on, they ought to be about the bigneſs of a common ſowing Needle, for if too big they make too great a Wound, and cauſe too much Pain.

And if too ſmall they may readily break, but thoſe made uſe on by the beſt Practitioners are them a little flattiſh at the Point, and which I have more uſually made uſe on than the round ſort.

And having determin'd the Part you are to thruſt the Needle in, which is to be about a Shilling's breadth from the *Cornea*, that is in the white of the Eye and Middle, neither too high, nor too low, for if you paſs it in at the joining of the black and white, or *Cornea* and *Sclerotica*, it proves more Unſucceſsful, as likewiſe, that there is more difficulty in paſſing through that little Coronet or Inſertion of the *Uvea*, with the *Ligamentum Ciliare* and *Choroides*; having then thruſt the Needle in the Place afore-

aforesaid, pass it athwart the Eye till such time as you see its Point appear betwixt the Pupil and Cataract, or advance it to two thirds of the Pupil, and raising its Point towards the upper Part of the Cataract, endeavour to work or beat it down to the lower part of the Pupil, that is, betwixt the *Uvea* and Vitrious, and waiting a little to see if it does not rise, you may then withdraw the Needle.

Let the Needle be well polish'd and warm.

It may not be improper I here take notice of all the Parts the Needle passes thro', which is not what I have seen in any Author; having then gone through the *Tunica Conjunctiva*, and *Sclerotica*, the next it must necessarily pass through is the *Retina* and Vitrious, since they both go as far as that little Coronet before mentioned, or the Insertion of the *Ligamentum Ciliare* and *Uvea*, which is just at the joining of the *Cornea* and *Sclerotica*, the Needle then being a Line's breadth within this, must needs pass thro' the forementioned Parts, after which it must pass through the *Ligamentum Ciliare* before it can come into that space betwixt the *Uvea* and the Cataract.

The Operation being perform'd, you are to apply Raggs or Bolsters dipt in the white of an Egg, or Rose-water, on the Eye, or some make use of the white of an Egg beat up with a piece of Alome. And

And having bound up the Eye (that is, both are to be kept ſhut) the Patient muſt be put in Bed, ordering him to lie on his Back, and his Head pretty high.

It is not to be open'd for Five, Ten, or Fifteen Days, according as the Inflammation continues, leſs or more, the white of an Egg is frequently changed as it grows dry.

He is to be kept quiet, to ſpeak little, not to eat things of hard Maſtication, but rather Spoon-meat; let him be kept to a ſpare Diet, and things of a clean and eaſie Digeſtion.

If the Inflammation ſhould prove violent, it will be very requiſite to Bleed and make uſe of Gliſters, or Lenitives.

And when the Eye comes to be open'd and well, let him take care of immediately running into the Wind, or Duſt, for fear of cauſing a new Inflammation or *Opthalmia.*

Sometimes the Needle happens upon one of the Blood Veſſels which are diſtributed in the *Uvea*, and will readily occaſion ſome Blood to mix with the Humour *Aqueous*, but that in time Precipitates, and rarely occaſions any Evil Accident.

CHAP.

CHAP. XXXV.

Some particular Observations I made in Couching.

THE first I perform'd this Operation on, was a Country Woman, and having thrust my Needle into that Space betwixt the Cataract and the *Uvea*, I begun to move my Needle, and keeping too far off, I unluckily touched or wounded the *Uvea* with the Point, which immediately occasioned a drop or two of Blood to appear in the Aqueous Humour, after which I took more Care to keep close to the upper Part of the Cataract till such time I brought it down, Couch'd it, and performed my Operation successfully, although I found afterwards that I had so wounded the *Uvea* as to make the *Pupil* lose its round Figure, yet the Sight continued, although probably not so perfect as it might have been, had not this Accident happened; the drops of Blood precipitated to the bottom of the Aqueous Humour, and were no more to be seen, so that the Woman enjoys a tolerable good Sight.

Another young Woman about the Age of twenty Years being troubled with a Cataract

taract on each Eye, I undertook to Couch the Right which was full ripe, and having first endeavoured to loose it from below, as some advise, (altho' I think a very wrong Practice) the Cataract immediately flew up, upon which the Patient cry'd out, I see your Face; but knowing that was not sufficient, being got above in place of being below, and finding it adherent to the upper Part of the *Uvea*, I endeavour'd all that was possible to get it down, although I could not, and believe the great Reason was, that squeezing or pressing the Globe with my Finger, in order as I thought to keep it more firm, I found I had forc'd out most of the Aqueous Humour at the Orifice, so that the *Uvea* and *Cornea* appear'd wrinkly. I then thought it was time to leave off, and withdrew my Needle, dress'd, and bound up her Eye.

I soon found the Eye again full as before, and the Cataract was just fallen down as formerly, having perfectly covered the Sight.

I then in a few Weeks there-after begun my Operation a-new, by forcing it down directly, which had the desired Effect.

About a Year there-after, this same Woman came to me to have the other Eye Couch'd, which

which I found to be uneven and rugged, or of the curdly Kind, and it seems was not full ripe; I nevertheless undertook the Operation, but found I had no sooner touched it with my Needle when it broke, and mixt with the *Aqueous* Humour, which becoming drumly, the Patient could no way see; I then withdrew my Needle, and begun to doubt of the Success, but I found in a Month's time all settled to the bottom, and her Sight become clear and well.

After this, an old Woman, who had been Blind with a Grey or Ash-coloured Cataract for about Eighteen Years, came to me to have it Couched, which I undertook, and found, after I had introduced my Needle and begun to work upon the Cataract, it would in no way yield; it seemed to be almost as hard as Horn, and when I endeavoured more forcibly to Couch it, the whole *Uvea* seem'd to yield and give way along with it, so that I found it to be close and strongly adherent there, and by no means to be loosen'd or got down without tearing the *Uvea* to pieces, so that I thought fit to let it alone and withdrew my Needle.

The other Eye was Blind, of two Years standing, the which I Couched without any difficulty.

After

After this, I begun to understand the nature of Cataracts a little better, and willingly made choice only of those I thought would succeed; and although I have met with some other old ones that would not yield, yet I do not remember any other Evil Accident which has happened to me than what I have mentioned.

CHAP. XXXVI.

Of the Glaucoma, *or Disease of the Christaline Humour.*

IT'S certain, the Christaline is subject to Diseases, as well as the other Parts of the Eye or Body, especially Decay and preternatutal Bigness, both which commonly pass under the Name of *Glaucoma*, although not well distinguished by Authors; the first sort is commonly of a light Sky blue, or bright Sea Green: The Patient at first is troubled with something like Mist, Smoak, or Clouds before their Eyes, the Pupil keeps its former bigness, whereas in the other sort it enlarges, or the *Uvea* shrinks, by reason of the Bigness of the Christaline, and its advancing or forcing forward upon the said *Tunica*; in this case it is generally of a whiter Colour, which,

It sometimes turns to yellow or black.

which, with the wideneſs of the Pupil, may eaſily be diſtinguiſhed from the former.

But in a word, either ſort being confirmed, cauſes a total Deprivation of Sight, nor is there any Remedy for one or t'other. *Oribaſius* tells us, *Glaucomata Omnia curationem non recipiunt.*

APPEN-

APPENDIX
OF THE
DISEASES
OF THE
EAR.

APPENDIX.

OF THE

Diſeaſes of the Ear,

AND

Of the mutual Communications of ſome Diſeaſes in the EYE and EAR.

CHAP. I.

THE Reaſon I here take Notice of the Diſeaſes of the *Ear* is, becauſe of the mutual Communications of ſome Diſeaſes of the ſaid Organs of Sight and Hearing; eſpecially in ſuch as *Ophthalmia Vera*, or

the Diſeaſes which affect the *Pericranium* or *Dura Mater*, both being continued to the two foreſaid Organs; for the firſt is continued to the *Tunica Adnata*, or *Conjunctiva*, commonly called the White of the *Eye*; this *Membrane* being the Seat or chief Part affected in *Ophthalmia*: And according to the degrees of this Diſeaſe, the *Pericranium* ſeems to be more or leſs affected; it is likewiſe to be obſerved, that this ſame *Membrane Pericranium* is continued to the * *Tympanum*, as likewiſe by the *Sutures* of the *Cranium* to the *Dura Mater*, and the ſame *Dura Mater* covers and enters in with the Auditory Nerve at the Hole of the Internal Proceſs of the *Os petroſum*, where ſome part of it, eſpecially that of the *Portio Mollis*, expands it ſelf, or is continued to that delicate fine *Membrane* which lines the Cavities of the foreſaid Bone of the *Ear*, and this ſame *Membrane* to the inner-ſide of the *Tympanum*. As I have ſaid, the *Dura Mater* is continued through the *Sutures* to the *Pericranium*; and the ſecond Pair of Nerves having left their *Origine* or *Corpora Striata*, and *Thalami Nervorum Opticorum* in the Brain, at their paſſing out at the foremoſt Hole of the *Os ſphænoides*, receive their External Coat from the *Dura Mater*, which is continued

* *That is, by the* Meatus Auditorius *to the outer-ſide of the* Membrana Tympani.

tinued or makes up the *Tunica Sclerotica* of the *Eye.*

It is no wonder then of the Sympathy betwixt these two Organs, especially where either of those two *Membranes* are very considerably affected, and what I have frequently and for the most part taken Notice on, in those troubled with an *Ophthalmia Vera*, especially upon the use of Repellents or cooling Medicines to the *Eyes*, or Forehead, has forced the Humour backwards to the *Ear*, and occasioned a dulness of Hearing, and upon its growing better has immediately again returned to the *Eye.*

This I have frequently observ'd in these inveterate *Ophthalmia's*, and have known but few of a very long standing, where the Patient has not at some times been troubled with a dulness of Hearing during his illness of this Disease. It may likewise be observed that in this especially, or the Diseases of the said *Membranes*, the same Universals are equally proper for both.

The Extensions of the *Pia Mater* to those two Organs might likewise be considered, as it gives the internal Coat to those two, as well as the rest of the Nerves, and enters into the Bones of the *Ear*, as well as

to the *Eye*, where it makes up or is continued with the *Tunica Choroides*.

I doubt not, something might be said of the Membranes of Smelling and Tasting, but Defluxions seem more sensible to the Hearing.

It's true, it may be alledged that the *Dura* and *Pia Mater* are continued with the Nerves to all the Parts of the Body; but when we consider the particular *Membranes* I have named, (they make up) in them two Organs, and the Contiguousness or Nearness of the Parts, it will no way seem strange, although it be not what I have seen taken Notice of by any Author.

Thus then having considered the Reasons for some Sympathy or Communication betwixt some of the Diseases of those two Organs; I shall in the next place take notice of the Maladies incident to the *Ear*, with their Cure.

Nor would I trouble my Reader with a long Description of those Parts, since I could say but little else than what has been said upon that Subject already, and so very well described by *Skillhamnaer*, *Duverney*, and *Valsalvo*; I shall only take notice that I could never see the *Vestibulum* full of *Mucus*, as the latter pretends, excepting in Infants of a few Months old, where all the Cavities seem to be full.

CHAP.

CHAP. II.

Inflammation of the Membrane of the Meatus Auditorius.

THIS Membrane is very Nervous, and conſequently ſubject to cauſe violent Pains and Dolor; this is readily occaſioned by Obſtructions of the Glands and Blood Veſſels, diſtributed in thoſe Parts, either by External or Internal Cauſes.

This Membrane extends it ſelf upon the boney Part of the *Meatus Auditorius*, and ſeems to join the *Pericranium*; the Remedies moſt proper in Inflammations of this Membrane, are ſuch as Injections made up of Women's Milk, *Ol: Amigd: Amar:* and White of Egg, at the ſame time Bleeding is very proper, and gentle Catharticks; but if theſe ſhould not give Eaſe, but that it tends to Impoſtumate or Supurate, it muſt be treated as hereafter, in the mean time it may be obſerved, that theſe things are very proper in *Opthalmia's* likewiſe.

CHAP. III.

Of Dolor in the Ear by Cold.

WHEN the Disease proceeds from Cold, the aforesaid Universals are also proper, and ventosing is sometimes of great Use; however, as to the local Remedies, it will be more proper to instil into the *Ear*, Oil of *Rue*, *Lillies*, and *Euphorbium*, or if mixt with a little Spirit of Wine, stopping the *Meatus* with a little Wool, and hot things may be applied Externally. It may be observed, that *Cucuphas* for the head of Herbs and *Aromatics*, are very proper here, as also in *Opthalmia's*, not forgetting Bathing and Sweating which is very useful in both.

CHAP. IV.

Of Impostumation or Tumours of the Ear.

THESE are very dangerous, oftentimes occasioning a violent Fever, Swoonings, *Dilirium*, and sometimes Death, before it come to Supuration; the best way is to bring it as soon to Maturity as possible by the Use of Cataplasms and Poultesses, such as that made up with *Farina Fabarum*, *Lillie-roots*, *Unguent. de Althea*,

Althea, and Oil of *Chamomile*, to be applied warm to the external Ear; and let be dropt into the Ear, Oil of *Roſes* and *Myrtil.* The Reaſon of the violent Pain, as I have ſaid, is occaſioned by the Nervouſneſs of that Membrane, and probably the more dangerous by reaſon of the nearneſs of thoſe Parts to the Brain.

CHAP. V.

Of the Ulcers in the Ears.

THESE are a Solution of Continuity in the *Meatus*, occaſioned by the opening of an Impoſtumation, or ſome ſharp coroding Humour there; it generally renders fœtid or purulent Matter, and is accompanied with Dolor, and ſometimes Fever, or other ill Symptoms; it may be known by the aforeſaid Matter iſſuing out, or oftentimes a bloody ſort of *Ichor*. As to the Remedy, make uſe of warm Injections made with Honey of Roſes, White Wine, and Barley-water, and there-after let be dropt into the Ear Oil of Leeks, or Juice of Onions, with Honey, and a little Oil of Turpentine. Some inject with the Urin of a young Child; the *Aquafallopii* or *Phagedenick* Water with Honey is likewiſe of good Uſe, and for Cicatriſing, ſome make uſe of Nut-Galls ſteep'd in Red Wine, with a little Honey.

CHAP. VI.

Of Worms in the Ears.

THERE are ſometimes Worms or Sheep-lice in the Ear, for which the Tincture of Myrrhe and Aloes being dropt into it, rarely fails, or Brandy; as alſo the uſe of bitter Oils, or Juices, as that of Wormwood, Centaury or Colocynth, or Gall of an Ox with Wine or Vinegar, or Aloes diſſolv'd with Urine. Theſe either kill Worms or Inſects, whether bred there, or got in by Accident.

CHAP. VII.

Of Dulneſs of Hearing occaſion'd by Stoppage or Swelling of the Aqueduct, or Ductus Falopianus.

THIS Conduit comes from the Barrel, and opens behind the *Uvulla*; if it be ſtopt, it occaſions a Dullneſs of Hearing, which frequently happens upon catching cold, as when the Glands and Membrane of the Noſe is ſwell'd; it at the ſame time affects the Membrane of the Palate, and that of this Duct, which by ſwel-

ſwelling hinders the Air from paſſing in ſo freely that way to the *Tympanum*; and that being abſolutely neceſſary, its Obſtruction occaſions that Dullneſs of Hearing. This is evident; for by gaping very wide, or yauning, the Duct opens, and the Air gets in more freely; at which time the Ear ſeems to give a ſudden Crack, and for a little while ſhall hear better. This may be cured by the uſe of Errhines for the Noſe, Fumigations and Sweating. Mr. *Borhave*, Profeſſor in the Univerſity of *Leyden*, ſays, he cured a Dullneſs of Hearing cauſed by an Obſtruction of this Duct by Means of a Gargle, which may very well be; it's certain that Maſticatories here are likewiſe of very good uſe.

CHAP. VIII.

Of the Wax hardned in the Meatus Auditorius.

THIS Diſeaſe happens frequently, and is one of the eaſieſt cured. It may either be taken out by a ſmall Inſtrument made on purpoſe, or by the uſe of Injections, with a Leaf of Tobacco boil'd or ſteept in Water and White Whine, with

a little Oil of bitter Almonds, or plain warm Water, or mixt with a little Milk to make it more soft. *Bartholin* tells us of small Stones or Gravel coming out of his Wife's Ear. My very good Friend Mr. *Hunter* having syringed a Gentleman's Ear, who had been troubled with a Dullness of Hearing for near two Years, brought away Abundance of hard Wax, in which there was a small *Cochlea*, or Snail's Shell, which seem'd to fill up the *Meatus*; but how it came there is the Question. My Friend still keeps the Shell. I'm of Opinion it might enter there while very small, either by being in the Water, or otherwise; and when there, it might augment and grow bigger by the Warmth, as other Worms which are hatch'd in the Body.

CHAP. IX.

Of the extraordinary Extension and Relaxation of the Membrana Tympani.

THE first is probably occasion'd by an Inflammation of that Membrane, and may be treated much in the same Manner as I've said before in the *Meatus Auditorius*. The Relaxation is readily caused by a cold and

and moiſt Humour; and things hot and dry are to be uſed, as Spirit of Wine dropt in the Ear, or Brandy; as alſo a little Cotton wrapt round a Clove, and ſtopt in the Ear, and the uſe of Fumigatories, Sweating, Cupping and *Cucuphas*.

FINIS.

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